



# INDIAN MUNITIONS BOARD

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## Notes on Wool in India

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A. H. SILVER, C.I.E.

(Controller, Textiles)

1919

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(Assistant Controller, Industrial Intelligence)

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Published by order of the Government of India

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SOLD AT THE  
OFFICE OF THE SUPERINTENDENT GOVERNMENT PRINTING, INDIA  
8, HASTINGS STREET, CALCUTTA

1919

Price Rs. 12 or 18.



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## PREFACE -

THIS note on wool in India has been drawn up at the suggestion of the President of the Indian Munitions Board, and aims at little more than being a synopsis of such records as at present exist in India, together with further particulars which have been obtained specially by correspondence from various centres, or which have been gathered in the course of the Board's operations. No standard or any other work exists at present dealing with wool in India as a whole and it is hoped that this brochure may be useful as a basis for the eventual production of such a work. The notes have been put together while carrying on the active purchase work connected with the Textiles Branch of the Board, and consequently with very limited time at the disposal of the writers—they ask, therefore, that the somewhat sketchy character of the notes may be excused on this account and the work, such as it is, treated as being only the preliminary collection of existing scattered information, which has been published in its present form in order that it may be of some use to those interested in the possibilities of wool growing in India.

To the various authors whose works have been utilised in the compilation of this brochure, the grateful acknowledgments of the writers are tendered. A list of the works consulted is given at the end (page 60).

A H SILVER

J K MEHTA

*31st January, 1919.*





# INDIAN MUNITIONS BOARD

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## Notes on Wool in India

### CHAPTER I

#### INTRODUCTORY

Wool as an article of trade and industry appears to have been known to India from ancient times, as is evidenced by the injunctions of the Institutes of Manu which prescribe wool to be used for the sacrificial thread of the Vaisya. That a semi-sacred character has long been attributed to wool by Hindus is also shown by the fact that *Parayana Sara Sangraha* directs that the *śradh* ceremony should be performed when clad in woollen clothing "as oblations offered to ancestors with such clothing on are said to be like a *śradh* performed in Gaya, while the *Harita Smṛiti*, one of the Dharma Shastras, says "fire woollen cloth, Brahman and Kusa grass, these four were created pure by the All Good Brahma." A number of religious practices are associated with wool, some of which are described by Mr A W Pim, in his "Monograph on Woollen Fabrics in the United Provinces," published in 1898. Mohammadans have not apparently assigned any special religious virtues to fabrics made of wool, but frequent mention is made of them in Arabic and Persian literature, indicating that wool is considered to be the proper clothing of the devotee.

It is generally believed that the art of weaving preceded that of spinning, and that the oldest woollen garments were plaited of cords of wool much after the fashion of reed and grass mats. The utilization of the felting properties of wool, and the application of these properties in the manufacture of felt, appear to have been made at an early date, for felt making is reported to have been practised

by Asiatic craftsmen long anterior to the establishment of the industry of spinning and weaving wool. Unfortunately, very few attempts have been made in the past to give a connected idea of the development of the woollen trade, and practically no records exist regarding the position of this trade in the times preceding the British rule in India.

Reference may be made to Milburn's *Oriental Commerce* (a work published in 1813) which refers briefly to the Kashmir trade in shawls and fine woollen goods, but almost the only notice of wool in general is the occurrence of the name in a list of goods which were not admissible at the Government Customs House at the Bombay Bunder, but which could be taken at the Muzjid Bunder. In 1805 the Bombay imports of wool were valued at Rs 3,45,299, while the first record of the export of raw wool from India appears in 1834, when the quantity exported was reported as 69,944 lbs. The experiment, if it were an experiment, appears to have had prompt and satisfactory results, for the export of 1835 is reported to have been 486,528 lbs, in 1836 the figure was 1,196,664 lbs and 2,444,019 lbs in 1837. In 1872 the export is reported as 24,122,562 lbs, and from that date onwards the export has progressively increased, as will be seen in the statistical chapter relating to exports.

Wool exported from India consists not only of wool grown in India itself, but of imports from foreign sources, these latter coming into India both by land and by sea.

Imports by sea come chiefly from Persia, but a certain quantity from Persia also comes by land, while the main imports are from Afghanistan, Central Asia, Tibet and Nepal. Quetta, Shikarpur, Amritsar and Multan are the main collecting centres for wool received by land from Afghanistan and Persia, from whence it is almost invariably railed to Karachi for subsequent export overseas.

In 1853, Lord William Hay, while Deputy Commissioner of Simla, wrote in the *Journal of the Agri-Horticultural Society, Punjab*, regarding wool disposed of at the annual fairs held at Rampur. The wool and *pashm* brought to these fairs for sale were described as being from a peculiar breed of sheep and goats found only in those elevated regions, lying north and north-east of the great Himalayan range, known as Great and Little Tibet and Chinese Tartary. The wool was from a sheep known as *biangi*, and was described as being remarkable for its softness and length of staple, whilst the *pashm* or shawl wool was the under-fleece of the goat and was singularly

soft and fine *Pashm* is ordinarily divided into two grades, one the black, or rather grey, called *shahr*, and the other the white known as *phum* or *pashm*. From the latter grade are manufactured the shawls for which Kashmir is famous, and from the former are made the pashminas and better class puttoos.

Lord Hay says that the great markets for the sale of wool and *pashm* were Rodok and Garoo or Gartal, both places situated within the limits of the Chinese Empire. Rodok is on the right bank of the Indus about half way to Leh, the capital of Ladak — no fair appears to have been held here. Garoo is situated in the midst of an elevated province of Tartary where Tartar shepherds remained during the summer months for the purpose of pasturing their sheep, and a fair was held annually during the month of *Bhadon* (September-October). The wool having changed hands by purchase at the fair, it was packed immediately on the backs of sheep and goats, and taken off by the buyers to various destinations. *Pashm* was chiefly purchased for the Kashmir and Rampur markets; some, however, found its way to Sultanpur in Kulu, and a smaller quantity to the plains of India *via* Gahwal and Kumaon. The principal fair at Rampur was held in the month of November and lasted about 3 days. The *pashm* was sold there for ready cash only and was bought by Kashmiris from Amritsar, Ludhiana and Noorpur. Of white *pashm* approximately 600 maunds and of black *pashm* approximately 100 maunds were disposed of annually (one maund =  $82\frac{2}{7}$  lbs). The traders who dealt in this wool were for the most part inhabitants of Spiti, Lahoul and Kunnawul, being almost identical with the Tartars of Tibet, and they rarely came lower than Rampur. The sheep and goats bringing down the *pashm* were utilised for the transport of return merchandise, 30 seers being usually the load carried by one sheep (40 seers = 1 maund). It is interesting to observe that, at the time of writing his note, Lord Hay expressed the opinion that the supply of Tartar wool was almost inexhaustible.

The main purchasing centre in India for Tibet wool is at Kalimpong, which is now served direct by a branch line—the Teesta Valley Extension—of the Darjeeling Himalayan Railway. But a fairly large quantity of wool is also brought into India *via* Tanakpur, also now directly connected by rail with the main system of the Rohilkund and Kumaon Railway. Tanakpur is connected by road with Askat where tracks diverge, one leading by the Antadhar Pass to

Gartok and the other to the Neodhura, Lampiyadhura and Lipulaki Passes, the last named being the easiest road to the sacred resorts of Hindus, Mount Kailash and the Mansrover Lake. Tibet wool is also brought to Haldwani and Ramnagar in the United Provinces, Bejwaganj and Raxaul, situated on the Bengal and North-Western Railway, are other frontier stations for the marketing of wool.

The chief centres of origin of what is known as Central and Eastern Tibetan wool are Lhasa, Shigatse, Gyangtse and Pharijong, some wool also coming through Lachen and Lachung in Sikkim. The purchase price of wool in the interior of Tibet is governed by the market price at Kalimpong and according to the distance from the market centres—the original price paid to the holder being sometimes as low as Rs 8 per maund. The main route taken by traders bringing wool to Kalimpong is *via* Gyangtse, Pharijong and the Jelep-la Pass. Wool is generally taken over by merchants at Lhasa, Shigatse and Pharijong, and at the last-named place the wool is bought by Chumbi Valley traders. The wool is sold in the first instance by the owner of the sheep, usually a very small owner, to larger and richer owners who carry out the negotiations with the dealers coming from the centres named above. These dealers in their turn usually hand over their wool finally to the Chumbi Valley traders at Pharijong, who monopolise the transport to Kalimpong. These Chumbi Valley traders ordinarily utilise the sale proceeds of the wool to purchase various commodities in India, mainly cloth and metals, for transport back to Tibet and sale there, but during the war, on account of high prices for all commodities in India, they have carried back a good deal of actual cash. Wool is usually transported from its place of origin in Tibet as far as Pharijong by yaks, while from Pharijong to Kalimpong it is carried by mules, as the yaks are not able to stand the journey from Pharijong to Kalimpong. Sheep and donkeys are also utilised to a certain extent as far as Pharijong, but not onwards. The men who organise the transport up to Kalimpong are known as *Khumbas*, and they are paid either by yearly contract—the sum paid being from Rs 20 to 30 per annum per mule *plus* 2 suits of clothing for the driver and food for both driver and animal—or by weight of load, the fee being from Pharijong to Kalimpong from Rs 4 to 5 per maund, each mule being able to carry 2 maunds per trip.

The chief marts for Western Tibet are Taklakot, Gyaniima and Doba. From the two former the wool goes to Tanakpur, Haldwani

and Ramnagar by the Bias, Dharma and Johar routes, while wool from Doba goes to Ramnagar by the Niti route (Garhwal district)

The trade in Tibetan wool is largely governed by the amount of transport available and the quality of the roads. India at present receives only a comparatively small portion of the wool which is grown in Tibet and it seems improbable that any large increase in these imports can be looked for until material improvements are made in the road communications.

The largest market in India for indigenous wool is at Fazilka, where the Bikaner wool probably the best in India, is brought for sale. Beawar is also a fairly large up-country market. Karachi and Bombay are the ports from which the wool is mainly exported, and are therefore large collecting and clearing centres. Wool is brought into Fazilka mainly by camels and bullocks, and the carriers are paid on a basis of value the usual rate being about 12 annas per hundred rupees. The traders at Fazilka are mainly Hindus of Bikaner and Beawar and the Punjab. A certain amount of cleaning is done at Fazilka and the bulk of the wool is after pressing forwarded to Karachi for shipment although the Indian mills purchase large quantities in this market. Unfortunately inferior wools of the *desi* type are commonly sent to Fazilka and there mixed with the better types coming from Bikaner the intention being to gain for these lower types of wool some portion of the higher price which is usually associated with wools marketed at Fazilka, due to the fact that it is the centre where the better types of wool have always been sold.

There is a wool market at Bombay situated near the Purna Pole where some 30 merchants are engaged in the trade. Wool sold in the Bombay markets comes from Rajputana, Jodhpur, Gujerat and Kathiawar. Bombay is also the market for Persian wool brought in by sea, although latterly much Persian wool has been exported direct from Basrah, where there are now arrangements for cleaning and pressing.

## CHAPTER II

## IMPORTS AND EXPORTS

The total imports of wool into India by sea were in 1890-91 4,236,826 lbs, falling to 3,364,938 lbs in 1899-1900. Imports by sea. During this period the highest point was reached in 1895-96, when the imports were 5,552,258 lbs valued at Rs 16,07,484. From 1900 onwards to 1909-10 there was a further appreciable fall in imports, the average import for the period being about 2,250,000 lbs. There was an increase, however, again from 1910-11, and the figures rose with slight fluctuations to 4,708,701 lbs in 1915-16, with a slight decrease in the following year, and a further decrease to 2,651,071 lbs in 1917-18. About 70 per cent of the imports come from Persia and approximately 10 per cent from Australia, these latter being entirely for the use of Indian mills in the manufacture of fabrics for which Indian wool is not suitable.

Persia has maintained an almost steady export of wool to India, the figure being 2,577,416 lbs in 1899-1900 and 2,852,643 lbs in 1916-17. Asiatic Turkey has contributed to India's imports by fits and starts only. Up to 1907-08 the Persian Gulf is reported as having sent only insignificant quantities, but after 1911-12, when the figure of import was 13,280 lbs. only, these imports have risen to 176,232 lbs in 1916-17. Imports from Arabia were in 1899-1900 39,312 lbs which fell in 1901 to 16,240 lbs, but rose again to 206,024 lbs in 1901-02. These figures continued fairly constant up to 1903-04, when the import into India reached 299,824 lbs, for the next seven years imports fell off again, until in 1912-13 they amounted to 196,238 lbs. Very little came in 1913-14 and 1914-15, but the imports for 1915-16 and 1916-17 were 345,508 lbs and 400,972 lbs, respectively.

To-day, Bombay is by far the leading province in the imports of wool by sea, although at one time Sind competed with Bombay. For instance, in 1880-81 Sind imported 1,480,634 lbs while Bombay imported in that year only 1,294,920 lbs.

The average rate of imports into India by land during the period 1879-80 up to 1881-82 was 7,109,021 lbs annually, while the average imports during the period 1888-89 to 1890-91 amounted to 15,403,021 lbs. Dr Watt observes that there are certain instructive features attaching to this increase. The Sind-Peshin (Kandahar) Railway began to carry wool in 1880-81, prior to that date the Baluchistan and Afghanistan wool had been carried to the Indian ports on camels and other beasts of burden. The imports from these countries in 1879-80 came to only 6,753,000 lbs, whereas the average quantity carried by the Kandahar Railway alone during the years 1888-89 to 1890-91 came to 10,319,680 lbs. It would thus appear that the opening up of that railway had the immediate effect of immensely expanding the import of wool from Kandahar. A similar effect can be traced in the extension of railway communication to Darjeeling, the imports from Sikkim, Bhutan and Eastern Tibet having been greatly augmented since the construction of that railway. From 1879-80 to 1887-88, the imports from Tibet averaged 118,000 lbs only, but in 1888-89 they became 612,016 lbs., in 1889-90 they amounted to 752,192 lbs and in 1890-91 to 1,328,908 lbs. Today they amount to over six million lbs. The same and other illustrations of the expansion of the trans-frontier imports of wool were interpreted by Dr Watt as indicating the possibility of still greater expansion as the facilities of transport were improved and extended. That this interpretation was warranted is clear from the figures of imports of subsequent years. The quantity of wool imported by land which was on an average, something less than 7½ million lbs annually, in the period from 1879-80 up to 1881-82, increased to 17½ million lbs in 1908-09, to 21½ million lbs in 1913-14 and to 33 million lbs in 1915-16.

As already mentioned briefly in the opening chapter, the chief countries from which imports into India come by land were and are Afghanistan, Northern and Eastern, Afghanistan, Southern and Western, and Tibet. Imports from Afghanistan, Northern and Eastern, were 803,600 lbs in 1908-09 and increased to no less than 4,177,600 lbs in 1916-17. Imports from Southern and Western Afghanistan increased from 7,532,221 lbs in 1908-09 to 12,141,472 lbs in 1916-17. The total weight of wool sent to India by Tibet is reported as 5,409,600 lbs in 1908-09 and 8,620,861 lbs in 1916-17, but there is reason to believe that this is not strictly accurate, and that the figures include some two million lbs of wool not properly classed



as Tibetan Wool from Tibet enters Bengal and the United Provinces chiefly, that from Central and Eastern Tibet being sold at Kalimpong, while wool from Western Tibet, whose capital is Gartok, mainly passes to Tanakpur. Wool from Central Asia is received by Kashmir and the Punjab, while the wool from Afghanistan is received in the Punjab and Sind. Unfortunately, statistics according to provinces are not fully given in the publications relating to land trade.

There was a decrease in 1916-17 in the Frontier trade with Siam and Persia, but an increase with Tibet, chiefly on account of the large demands for this type of wool for consumption by the mills of India in the manufacture of army goods, the far-reaching effects of the war thus extending into the plateaux of Tibet. Since 1916 the whole of the imports of wool from Tibet have been taken over by Government for use in India for war purposes, but this control will of course be released now that hostilities have ceased.

The total imports of wool by land into India for 1916-17 were 38 per cent above the pre-war average, although they were less than those of the preceding year by 15 per cent, which may be taken as indicating that the high prices of 1915-16 brought out, more rapidly than would otherwise have been the case, such stocks as existed in the interior. Tibetan wool imports during 1916-17 showed an increase of nearly 10 per cent upon the preceding year, mainly on account of the heavy imports *via* Kalimpong, but imports from Afghanistan in 1916-17 were 19 per cent less than those of the preceding year, although much above the pre-war average. The decrease in imports from Afghanistan was probably due to freight and finance difficulties.

The first record of the export of raw wool from India relates to the year 1834, when, as already mentioned, Exports by sea the quantity exported was reported as 69,944 lbs, advancing rapidly until in the year 1872 it had become 24,122,562 lbs. After having reached that figure, the trade appears to have remained comparatively stable for 20 years more, and the exports in 1892-93 were reported as 24,717,907 lbs. Then began another period of increase. In 1899-1900 exports had risen to 31,935,412 lbs, and, although there was a fall to 21,873,907 lbs in 1901, in another decade they had risen to 58,305,651 lbs in 1910-11. Following a small decline in subsequent years, exports rose again to 65,023,752 lbs in 1915-16, only to fall again to 48,107,664 lbs in 1916-17. This

last decline, however, may be attributed without hesitation to the difficulties of finding both freight and finance for export, and, in some degree, to the increased consumption of Indian mulls, which at that period were all controlled by the Government of India and were working night and day in the production of army goods

India's chief customer in pre-war days was pre-eminently the United Kingdom, followed by the United States of America and, to a comparatively small extent, Germany and France Under war conditions wool can only be exported to the United Kingdom, and there have consequently been no exports of late to the United States of America, but in any case their proportion was always very small and consisted mainly of Tibetan wool exported from Calcutta

It has been the practice to classify the re-exports of foreign wool, that is, of wool brought into India by sea, separately In 1890-91 these re-exports amounted to 12,788,216 lbs, and to a much reduced figure, namely 7,146,628 lbs, in 1910 This figure continued to be reduced until it reached 5,154,040 lbs in 1909-10 Under war conditions, which blocked the direct export of wool from Basrah, India's re-exports (by sea) rose to 16,842,037 lbs in 1915-16, although the figure declined to 13,120,881 lbs for 1916-17 Probably the same difficulties with regard to freight and finance were responsible for this decrease. As in the case of general exports of wool, our chief customer for re-exported wool is the United Kingdom

It may be remarked here that no process of disinfection takes place in India The possibility of introducing legislation to prevent the export of wool likely to be infected with anthrax was raised by the Secretary of State in 1905 and again in 1911, but after careful examination by the Government of India the conclusion arrived at was that this was not feasible under existing conditions But in certain areas, notably Madras, regulations are in force which require the owner to destroy effectively any animal dying from or known to be infected by anthrax

## CHAPTER III

## PRODUCTION IN INDIA

Figures relating to the world's production of wool are given in Appendix No 1 (page 61), and may be consulted. Under existing conditions it is very difficult to get any accurate figure as to the total production of wool in India itself, but it is generally estimated from such data as are available to be 60,000,000 lbs. For trade purposes all wools grown in the world are roughly divided into three groups according to their fineness, namely Merinos, cross-breds and carpet wools. Indian wools are classed as a whole as carpet wools, although some of the finer qualities, such as the best wools from Bikanir, are more of a cross-bred type and can be used for clothing. The wool exported from India is generally used by home manufacturers in the manufacture of blankets, rugs, carpets and felt.

As mentioned above, it is very difficult to estimate with any degree of accuracy the production of wool in India, and the figure of 60,000,000 lbs has been arrived at from the available figures of the number of sheep in India and their estimated yield per fleece. The statistics relating to the number of sheep as given in various agricultural publications are based mainly on the cattle censuses. In Burma, Central Provinces and Berar, the census is taken annually, whilst in the United Provinces, Assam, Ajmer-Merwara, Punjab, Delhi, North-West Frontier Province, Bombay Presidency, Madras Presidency and Coorg it is taken once in 5 years. The last quinquennial census was taken in 1915-16 in the Bombay Presidency, in 1913-14 in the Punjab, the North-West Frontier Province, Delhi and Ajmer-Merwara, and in 1914-15 in the United Provinces, Madras Presidency, Assam and Coorg. In Bengal the cattle census was taken for the first time in 1912-13, and in Bihar and Orissa in 1913-14. The figures for Bihar and Orissa prior to 1913-14, as also those for Bengal for years prior to 1912-13, are based on estimates. Live stock in cities and cantonments are only included where it was possible to secure their

enumeration In the case of stock of the ovine class, Madras accounts for 32 per cent of the total excluding Bengal, followed by the United Provinces with 22 per cent, Punjab with 16 per cent, Bihar and Orissa with 12 per cent, and the Bombay Presidency, including Sind with 10 per cent. Figures are given in Appendix No 10 (page 83) from which it will be seen that the number of sheep in British India (excluding Bengal) has gone up from 18,029 800 in 1906-07 to 22 970,403 in 1915-16 an increase of 27 per cent. Madras had approximately 7,000,000 sheep in 1904-05, a number which is reported to have increased to over 10,000,000 in 1913-14. To the figures representing the estimated total number of sheep in British India must be added the number of sheep in the Indian States, and while statistics relating to sheep in British India are not sufficiently comprehensive to be accepted as reasonably accurate, the statistics of Indian States are still more defective and incomplete. Apart from the questionable accuracy of those which are available, no statistics at all are forthcoming for Hyderabad, Baroda, Baluchistan (native) or Sikkim. From such figures as are available, however, it may be accepted that Mysore is the biggest owner of sheep amongst Indian States its reported figure being 2,738,199. Bikaner reports 509,300 in 1910-11 increasing to 664 590 in 1914-15. Marwar had 488,228 sheep in 1910-11, this number remaining almost constant up to 1914-15. The approximate number of sheep in Indian States for which figures are forthcoming is 1,700,000. It would seem, therefore that the total number of sheep in the whole of India may be taken as approximately 30,000,000. The yield of wool per sheep is discussed in a separate chapter, but for purposes of calculation it is usually accepted that the average quantity of wool yielded per sheep per annum over the whole of India is only about 2 lbs, this forming the basis of the estimate of the total wool production of India as 60,000,000 lbs. It is interesting to note in this connection that the number of sheep in India almost equals that of the United Kingdom and is only slightly less than that of the United States. As will be shown subsequently, there is reason to believe that the yield of wool per sheep per annum in India could readily be increased to between 5 and 7 lbs—assuming the figure to be 6 lbs, it will be seen that the productive capacity of India's existing stock of sheep could be raised in a comparatively short time by scientific breeding by 120,000,000 lbs annually, representing a money value of approximately Rs. 60,000,000 or £4½ million on to-day's basis of exchange.

It may be remarked that most of the wool which enters British India from the Indian States pays an export duty to the revenues of the State, in some cases based on value and in others on weight. Thus duty is usually in the neighbourhood of  $1\frac{1}{2}$  per cent.

## CHAPTER IV

## CHARACTERISTICS OF INDIAN WOOL

As has already been remarked, all Indian wools are classed in the grade of carpet wools, and it is correct to say of perhaps fully half the breeds of sheep found on the plains of India that they yield a kind of hair rather than of wool. They are reared chiefly on account of the mutton, and the fleece has been generally regarded as of subsidiary interest. In many respects, in actual fact, the Indian plains sheep approximate more nearly to the accepted type of the goat rather than of the sheep. Short remarks in his manual on Indian cattle and sheep, particularly with respect to the Madras type that they "resemble a greyhound with tucked up belly, having some coarseness of form, the feet light, the limbs bony, sides flat and the tail short."

The following is a rough classification of the principal types of Indian sheep —

(1) *Rajputana or Mewar sheep*—These are the finest and largest plains sheep in India, and many of them are annually sent in droves to different parts of Upper India for sale. Unlike those in other parts, these sheep are mainly white in color, and the wool is generally of good, sound quality, suitable for the manufacture of comparatively coarse woollen broadcloth.

(2) *Bengal and Patna sheep*—The former are inferior to the latter—the Patna sheep is considered one of the best Indian breeds and yields wool of fair quality. The Patna rams are commonly used for improving other breeds.

(3) *Madras sheep*—The wool yielded is a short, very coarse type, almost approaching hair.

(4) *Nellore sheep*—These are smaller in type than the Madras sheep, but the bodies are well covered with short wool.

(5) *Coimbatore sheep*—The fleece is of fair length, the staple being reported as from 4" to 5" in length.

(6) *Mysore sheep*—This is also a woolly breed, the staple averaging from 3" to 4" in length.

(7) *Bombay sheep*—In 1787 Dr Hove described this type of sheep as being the finest that he saw in India, "with long wool which was soft and white as the finest Gujerat cotton" If that description were true, then it can only be said that the breed has deteriorated very greatly to-day

(8) *Nepal sheep*—The wool is fairly long in staple, though coarse in quality as compared with corresponding types of hill breeds—

(9) *Himalayan and Tibetan sheep*—These types are sub-divided again into the following species —

(a) *Hunia of Western Tibet*—These sheep are nearly almost white, a wholly black sheep being unknown in this part The fleece is excellent in quality, abundant in quantity and of long staple, suitable for combing.

(b) *Silingia or Palluk of Eastern Tibet*—The fleece is extremely fine, and the people of China and Siling use it for the manufacture of the finest woollens It is of shorter staple than that of the Hunia sheep but still suitable for combing, and worth in the market about the same price as the Hunia fleece

(c) *Barual*—This is a Cis-Himalayan breed with abundant but coarse fleece, although much superior to the wool of the Indian plains This wool is used by local weavers for the manufacture of coarse blankets

(d) *Cagia*—This belongs to the Central regions of the Sub-Himalaya The wool is of short staple but of a fair degree of fineness—inferior to that of the Silingia and Hunia types but superior to the Barual in fineness, though not equal to it in length of fibre

(e) *Tasar sheep*—This is little superior to the wool found on sheep all over the Gangetic plains It is a coarse but true fleece

(10) *Hira and Dumba sheep*—These are large-framed animals having as their chief peculiarity the development of large masses of fat on either side of their tail or at its root

Although the wool from Western Tibet is generally held to be better than that from Central and Eastern Tibet, the British Trade Agent at Gantok explains that there is very little difference originally But the Central and Eastern Tibet wool passes through the

hands of many successive traders before reaching its market, and is commonly adulterated as well as roughly handled, whereas wool from Western Tibet is shorn, packed and taken down to the market in India by the same man throughout

The characteristics of Indian sheep and of their wool may now be examined according to the different provincial areas of India. It may be remarked here that in this and succeeding chapters information relating to Bengal has been allocated wherever practicable to the areas of Bengal and Bihar and Orissa, as now constituted after the changes in provincial boundaries

No good class of wool is grown in the Bombay Presidency. The staple is generally coarse and the fleece full of dead hairs, technically known as "kemps", which will not felt and which consequently protrude from the surface of the woven fabric

The fleece of the Madras sheep is very light in weight, short in length and extremely coarse—the best fleeces come from Mysore and Combatores. Most of the wool which comes into the market is dead wool—that is, wool which has been removed from the carcasses of slaughtered sheep, these latter being grown mainly for their skins. It is usually known as "Chunam wool," relating to the treatment of the skins in a solution of lime to loosen the wool from the skin. The Madras Manual of Administration (I) page 363 observes regarding Madras wool —

"The wool produced in Southern India from the native breed of sheep is of very coarse quality and chiefly employed for making *cumblis*, i.e., a large kind of blanket largely used by the Indians"

In the Combatores district, from which the better wools come, the special wool-yielding breed of sheep is generally designated Karumba, from the fact that they are tended by shepherds of that tribe. Most of the wool in the Madras Presidency is of black, grey or mixed colour

The sheep of Bengal are fairly uniform in form, size and coating. They are a diminutive class of animals covered with what may be termed short, coarse hair rather than wool. The sheep are usually something under 24" in height



Burma

The Burma sheep are of small size and the quality of wool very inferior.

In Bihar the sheep are valued more for their flesh and for the skin rather than for the wool and are generally

Bihar and Orissa

of very stunted growth, much like the local cattle. The Patna sheep, however, are of fair size and yield wool of comparatively good quality, though too coarse and short to be of much use in the manufacture of anything except low class woollens. No other particular breed is recognized, except that the local animals in Gaya and Shahabad are regarded as being the best in the province next to the Patna breed, but they are admittedly inferior to those that come in occasionally from Gorakhpur in the United Provinces. The wool is extremely coarse and usually brown or black.

There are two principal types of sheep in the Central Provinces, namely, Kupur and Wardha. The wool of the

Central Provinces

former is said to be finer and longer than that of the latter. Owing to the fact that there are no hill districts in the Central Provinces, there is no marked superiority of one grade over another, such as might be looked for in, say, the Punjab. The sheep are usually of brown colour, white sheep forming only a small proportion of the total—perhaps, 5 per cent.

The transactions of the Agra Horticultural Society of India (Vol. IV, page 240 of 1837) speak of the hill sheep as being a strong, robust animal such as nature made him, and that nothing had been done to improve the flock which was of a strong and substantial character. The transactions include a suggestion as to the formation of sheep farms on certain slopes of the Himalayas, but nothing appears to have been done to give effect to that suggestion.

North West Frontier Province.

It will be observed from the foregoing descriptions that Indian wools, generally speaking (as distinguished from the hill types of wool), are suitable only for comparatively low-grade woollens and unsuitable for worsted manufacture. To make this clear, it may be remarked that there are two great classes of manufactures which use wool as raw material—in the one, where the wool is carded only and in which a comparatively short-staple wool may be employed, the manufactured goods are known as woollens; in the other, where the wool is also combed and for which a comparatively long-staple wool must be employed,

General characteristics

the manufactured goods are known as worsteds. In worsted manufactures all the fibres employed are laid parallel to one another, while in woollens the fibres may be laid in any direction. In the course of worsted manufacture, the short-staple wool which may exist together with the long-staple is removed in the combing process, only the long fibres being retained for final manufacture into worsted yarns, the shorter fibres, known technically as "Noils", being then available for woollen manufacture. For this reason long-staple wools are generally known as combing wools, while the short-staple wools are known as carding or clothing wools.

## CHAPTER V

## SHEEP BREEDING IN INDIA

The origin of the domesticated sheep is not very clearly established. The parent stock seems undoubtedly to have been the *movflon* (*ovis aries*), which is still found in a wild state upon the mountains of Sardinia, Corsica, Greece, Barbary and Asia Minor. As to how these original varieties became settled in Great Britain or by whom and from where they were brought is not recorded. Bakewell, Culley Brothers and Ellman were the pioneers in sheep breeding and from their experience one has learned how types can be formed. This has been carried almost to perfection in Australia, where it is no uncommon thing for stud rams possessing valuable characteristics to be sold for over 1,000 guineas each, some of them yielding over 30 lbs of wool at one clip. No attempt has yet been made in India to establish the scientific breeding of sheep upon a commercial scale, although experiments are now under way upon a small scale in the United Provinces and Punjab under Government auspices. Indian conditions are such that independent initiative has been impracticable, the industry being in the hands of shepherds who are both poor and conservative in methods. It is said that there are religious prejudices which militate against the development of this and the cattle-breeding industry, but whether that be so or not, the position to-day is that India possesses only stunted specimens of sheep yielding very little weight of wool, and that in a quality which compares unfavourably in price with wool grown in any other part of the world. Dr Watt observes that different races of sheep when mixed together exhibit a pronounced clannishness which is inimical to spontaneous crossing. The members of a particular race seek out and prefer each other's company to that of any others of the flock. The peculiarities of crosses tend rapidly to return to those of the ancestors of greatest prepotency, and rarely assume racial or fixed proportions until after prolonged and repeated crossings and careful selection. The birth of races is thus due mainly to selection from useful variations and

to the crossing of such variations within a breed, until the characters desired become fixed and developed into what is recognised as a new breed. These considerations have become the axioms of successful rearing of sheep in all parts of the world, and it is probable that disregard of these considerations is largely responsible for the failures that have been experienced formerly in Indian experiments directed towards improving the breed of Indian sheep. It is found from reports of different experiments undertaken that crossing of widely different breeds has been regarded as the road to success, and it has apparently been thought enough to procure rams of a famous breed without regard to the peculiarities pertaining to the ewes, to the climate or to the pasturage.

Some of the technical terms applied to sheep may be explained

**Technical terms.** The male is usually denominated a "ram" or "tup." The term "lamb" is applied to the suckling young of both sexes, but the male, until weaned, is distinguished as a "tup lamb." When weaned until shorn (supposing him not shorn while a lamb) he is called a "hog," a "hogget" or a "teg." After shearing he is called a "shearling," "shear-hog," "dimmont ram" or "tup", and if castrated a "shearing wether." The female while sucking is a "ewe-lamb," and when weaned a "ewe-hog" or "teg." After shearing, she is known as a "shearing ewe."

The objects for which special breeding of sheep may be undertaken are divergent. Sometimes the object aimed at is to obtain a better quality of fleece in greater quantity, whilst sometimes the aim is to obtain a better quality of mutton. Thus in many parts of India, sheep are not regarded as a source of income through the medium of their fleece, but only from the quality of the mutton and the utility of the skin. In other tracts the fleece is considered of primary importance, while in many sections of the Himalayan race the sheep is valued mainly as a beast of burden. The English breeder has found it more profitable to forego a certain amount of quality in the wool in the development of a good and quickly fattening sheep that also affords wool of fairly good quality. In Australia, on the other hand, the merino sheep has been developed solely with a view to the value yielded by its wool, whilst breeders of cross-breeds take both wool and mutton into consideration. There is reason to believe that the merino sheep in Australia was developed

primarily on Indian stock, and this may be regarded as encouraging the belief that the Indian wool industry is capable of enormous developments if it only be practicable to apply scientific breeding upon a large scale

The pure merino sheep fattens very badly and yields a comparatively useless carcase, but it can live in a dry season on scanty pasturage and is able to produce good fleece where other animals would starve. Many types of merino sheep are grown in Australia, specially adapted to meet conditions where limited rainfall is experienced, and, in advertisements of Australian stock breeders, frequent reference is made to the powers of their breeds of merino sheep to exist under conditions of comparative drought.

We may now examine what has been attempted and achieved in different provinces of India with regard to the evolving of a better breed of sheep.

In Bengal no attempt is made by the shepherds to regulate breeding conditions—the rams are never separated from the ewes and no selection is made as regards the serving tup. Nothing is done to weed out deformed, barren and misshaped ewes or lean and sickly rams—the good and bad animals are allowed to roam about together. Under such conditions, it is not surprising that the breed of sheep in Bengal is of a degenerate type, but it must be remembered that the climate itself is not regarded as particularly suitable to spontaneous sheep breeding. Various attempts have been made from time to time by members of the Agri-Horticultural Society, by planters and by other private individuals, with and without the encouragement of Government, to improve the local breed by the importation of foreign stock, but no permanent results have been attained. At the suggestion of the Bengal Government, a committee of the Agri-Horticultural Society was convened a few years ago with the object, amongst others, of considering the possibility of improving the breeding of Bengal sheep. The committee, after careful consideration, seem to have arrived at the opinion that the chief aim should be the development of the carcase for the meat market and not the development of the wool. The high temperature and excessive humidity of large tracts of Bengal were pronounced to be inimical to the formation of wool. If this view be accepted, it would be useless to attempt crosses with a breed like the merino, which is perhaps the most inferior of all the breeds from

the butcher's point of view. There is no reason, however, for accepting this view as final if the matter of crossing is proceeded with scientifically. Three aspects of the question appear to have presented themselves during the last half century in Bengal, which geographically then included Patna, now in Bihar and Orissa, and it is more convenient to consider this subject on the basis of the old boundaries —

- (1) the crossing of Patna sheep with the Australian merino ;
- (2) the crossing of Patna sheep with Dumba sheep, and
- (3) the opening up of a sheep trade through Darjeeling

The possibility of improving the indigenous type without having recourse to the aid of foreign breeds does not appear to have been examined

In 1887-88, with a view to making experiments in cross breeding, two merino rams were supplied to Mr Abbott of the Jaintpore Factory in Muzaffarpur. Though these rams did not suffer from the climate of Bihar, they refused to herd with the native ewes. A ram was also supplied to the State of the Maharaja of Cooh Bihar, another to Mr Peppe of Ranchn and a third to Babu Bhagwat Dyal Singh of Daltonganj (Lohardaga). These rams were imported from Australia at a cost of Rs 692. The ram supplied to Babu Bhagwat Dyal Singh was herded with a flock of country ewes, two of which produced lambs of good quality. Mr Peppe's experiments conducted at the Tesil Tea estate were also attended with satisfactory results, and when samples of the wool from the cross-breds were sent to Mr Orin of the Bhagalpur Jail, he declared them to be far superior to the wool of the country sheep. He priced them at rather over double the price of country wool. The attempts, however, seem to have ended here. In more recent times, experiments in crossings have been conducted at Pusa with merino rams, but the result is not known to the writers.

In Madras, animals of all ages and of both sexes are kept together in the same flocks all the year round. The usual proportion of one ram to about 40 ewes is maintained but, as no trouble is taken with the mating, the members of a flock must be all fairly closely related. The rams are kept with the flock till useless and the ewes till they have dropped five lambs—the two chief mating seasons being June and November. Three lambs are said to be obtained in two years, but this does not

appear to be true for all the ewes Dr Royle mentions in his book on the "Productive Resources of India" that some little attention was early paid to the improvement of the breed of sheep in the Madras Presidency In the beginning of 1838, the Madras Government sanctioned the purchase of some merino rams which had been recently imported from Australia by Colonel Haselwood of the Madras Army Colonel Haselwood in a letter to Captain Jacob of the Bombay Artillery mentioned that experiments had been made in the Nilgiris by Mr Sullivan with merinos and by Mr William Rumbold with South-Downs His own flock consisted of 700 white country ewes with the merino rams imported from Australia The ewes appear to have been obtained in Coimbatore, and the results were stated to be most satisfactory with regard to quantity and quality of wool and size of carcase At the experimental farm at Sydapet, about 1869 Mr Robertson seems to have commenced to endeavour, by selection and crossing with Mysore, Coimbatore, Patna, and Nellore sheep to evolve a useful stock. This he is said to have secured and to have designated as the Sydney breed, but all traces of that have now disappeared Since then two attempts have been made in the Madras area to improve the breed of the white country sheep by crossing with Australian merino rams, the experiments being conducted in the higher parts of the peninsula, such as Coimbatore and the tableland of Mysore, where the temperature is somewhat cooler and pasturage more abundant than in the plain areas It is even now evident that in Mysore many of the sheep have foreign blood in them For a series of years the Madras Government endeavoured to improve the breeding of sheep in the districts of Salem, Coimbatore, North Arcot and Bellary by the distribution of superior rams Although these efforts improved to some extent the quality of the fleece, they cannot be said to have given any lasting impetus to scientific sheep breeding. The Department of Agriculture is now taking up the question of improving the breeding of sheep in the Ceded Districts, Bellary, Kurnool, Anantpur and Cuddapah, and a sheep farm has recently been opened

In Burma no attempt is made to keep the breeding pure, nor are white sheep kept separate from black sheep.

Burma

The proportion of rams to a flock is not fixed, but it is probable that it will be somewhat similar to the custom in India where usually one ram serves 50 ewes

Reference has been made in a previous chapter to the favourable opinion expressed many years ago by Bombay. Dr Hove about the sheep of the Bombay Presidency in general and of Gujerat in particular. The subject of wool appears to have next attracted attention in Bombay some 40 or 50 years after the date of Dr Hove's visit, when some Saxon merino rams were imported and an effort made to improve the indigenous breed. Colonel Jervis in 1835 represented to the Court of Directors of the Hon'ble the East India Company that the Deccan and Gujerat were well adapted to sheep growing. So satisfied was he as to the possibility of success that he started a sheep farm on his own account. The Bombay Government also started two sheep farms and placed them under one Mr Webb, the farms being one at Ahmednagar and the other near the fort of Juner. For the purpose of this experiment fairly large numbers of sheep were imported from Afghanistan, South Africa and England. The East India Company sent out 120 rams and ewes of the South Down, Leicester, Cotswold and Merino breeds. In 1843, we read of Sir George Arthur having reported on the farms in the most favourable terms, his previous colonial experience having qualified him to express an opinion, but unfortunately no record now appears to exist of what became of this enthusiasm and liberal expenditure. Nothing now is done in the way of selection for breeding purposes.

Perhaps more progress has been made of late in the United Provinces in the direction of scientific sheep breeding under Government direction than in any other part of India, and the notes of Mr Oliver, Superintendent of the Civil Veterinary Department, United Provinces, are worthy of study by any one wishing to take up the establishment of sheep breeding in India upon a commercial scale. His remarks are briefly summarised in the following paragraphs.

The records of the earlier attempts in the United Provinces to improve the breeding of sheep are of little help to those interested in the subject. Since 1825 spasmodic attempts were made from time to time to improve the breeds of the indigenous sheep, but they appear to have met with very little success, probably because of the want of continuity in the operations and the absence of a scientific basis for the experiments. There was no apparent regard for established knowledge in the choice of locality and the methods of breeding, so that the results generally were an ultimate return





introduced into the trial flocks, the first object being to obtain a sufficient number of half-bred merinos as a ground-work for future operations. Having now obtained a certain number of these half-breds, the following experiments are now being continued —

- (a) crossing of half-bred merino ewe with a pure merino ram,
- (b) mating of half-bred merino rams and ewes together (unrelated strains),
- (c) crossing the Indian ewes with half-bred merino rams

It will be seen then that definite lines of progression are marked out in the United Provinces, and the experience gained there, which should be available in a very short time now, should prove of great value to other parts of India where experiments have either not begun or have not progressed so far as they have done under the Civil Veterinary Department of the United Provinces.

Mr C E Low, ICS, in his Industrial Survey 1908-09 observes that the sheep-breeding industry as it exists in Central Provinces. the Central Provinces is practised by so few persons and is so entirely subsidiary that it is not worth trying to do anything for it, although it would be an excellent thing if the local breed of sheep could be improved. As has been observed in another chapter, more wool is wanted for local requirements, and the establishment of an improved type of sheep would almost certainly pay the shepherd better than the present type which, as Mr. Low suggests, is coated with cori!

Mr Clouston, Director of Agriculture, Central Provinces, says that as an industry sheep rearing in those provinces has not yet been considered sufficiently important to justify the Veterinary Department in making a special study of the subject. Till the whole question of breeding, feeding and diseases is taken up as a scientific problem, Mr Clouston considers that the industry in those parts will remain what it is at present, namely crude and unimportant. He also observes that there is a large scope for developing the wool industry there, provided that the lines of development are based on —

- (1) a general study of indigenous breeds and local conditions in so far as they affect sheep rearing, and
- (2) experiments with exotic breeds likely to do well when crossed with indigenous ewes.

The possibility of introducing a good wool-bearing strain by procuring merino rams for crossing indigenous ewes has already been tried in the Central Provinces, but was not successful as the merino rams did not thrive in the Central Provinces. Some half-bred merino rams were procured from Pusa and the progeny of these rams from local ewes provided a distinctly better fleece than was common to the local sheep.

No distinct district breeds are recognised in Bihar and Orissa. An attempt is now being made at Pusa to cross Gorakhpur sheep with Dumbas and with merinos in the hope of improving staple, and already some success has been obtained in this direction. In this connection the remarks under the heading of Bengal may be read, as the bulk of the work done in these breeding experiments was in territory now included in Bihar and Orissa, though formerly within the boundaries of Bengal.

Sheep breeding, if it may be called so where no attempt has been made at breeding, is in the hands of Punjab. Tehs in the northern and southern portions of Punjab and of Gaddis in the Kangra district. The last named are the better qualified shepherds but they appear to have no idea of breeding on systematic lines. The Civil Veterinary Department is at present endeavouring to teach the people what is necessary and how to improve the breeds of sheep. Some merino rams were introduced into the Punjab and placed at the Hissar farm in 1908-09 and 1909-10, also in the districts of Kulu and Kangra in 1909-10. Further, eight rams and 25 ewes were imported from Australia some years back and distributed amongst some of the zamindars together with a small money grant. The mating of pure-bred merinos with half-bred sheep is advocated in this province, and the experiment of breeding half breeds with each other is reported to have proved unsuccessful, the wool reverting to the former coarse type. The following description of the different types of sheep met with in the Punjab may be of interest —

- (a) *Dumbas*, a fat-tailed, comparatively coarse-wooled sheep, mainly imported from Arabia, Afghanistan and Peshawar. Large numbers are not seen in the Punjab, but it is regarded as a breed which should be encouraged in Dera Ghazi Khan. It can be crossed with most of the other varieties found in the Punjab, but a cross with a merino

ram is said to be difficult to get. Mr Taylor, Superintendent of the Civil Veterinary Department of the Punjab, does not recommend any interference with this breed, as it is a useful mutton sheep. Crosses with the Dumba ram and country sheep are good. The sheep is a fairly large-bodied animal comparatively short in the leg.

- (b) *Gaddi sheep*—This is not particularly remarkable and is said to have degenerated, but crosses with merinos are very promising.
- (c) *Brown faced*—These are long-haired sheep found in the Montgomery and Jhang districts. The wool is coarse. These sheep are longer in the leg than any other breed in the Punjab and it is believed could be greatly improved by crossing with the merino.
- (d) *Bagri sheep*—This is to be seen in the Hissar and Sirsa districts mainly. It is like most of the Indian sheep, leggy and coarse-wooled, but the ears are small and wrinkled. The defects of the sheep are improved by the merino cross.
- (e) *The Bikaneri sheep*—Like the Bagri sheep except that the ears are long. Traces of the Leicesters are said to be still seen occasionally amongst both the Bikaneri and Bagri sheep. The Leicesters were introduced during Colonel Robertson's time, about 1895, at the Hissar farm, but the experiment was abandoned and the sheep were sold and scattered about Hissar and Hansi.
- (f) *The Biang sheep*, found in Spiti and Lahoul. It is a long and coarse-wooled sheep, the fleece sometimes being as much as 12" in length, the sheep being shorn only once yearly. This breed is said not to do well below 10,000 feet. Numbers of them are used for carrying loads of salt and grain, the loads carried weighing from 8—10 seers. To prevent galling, the wool is not clipped on the shoulders and on the posterior part from under the tail and above the hocks. The sheep are generally leggy and narrow-chested.
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## CHAPTER VI.

## SIZE OF FLOCKS

As has been remarked previously, flocks in India are of very small size on the average, the industry being mainly in the hands of poor people. Generally speaking, flocks in India average from 50 to 100 sheep. The shepherds are more or less nomadic, moving about with their flocks from one place to another, though it does not appear that they ordinarily leave their province in their peregrinations. In some provinces there are shepherds who are not nomadic in character, but who combine the work of weaving along with shepherding. The following notes relate to the position in the several provinces.

Mr. Clouston, in his "Monograph on Woollen Fabrics," remarks that sheep owners in the Central Provinces are generally known as Kurumwaras and Dungars—they are sometimes classed together as one caste as they closely resemble each other in their habits and occupations, although Dungars claim that their caste is higher than that of the Kurumwaras. Both of these shepherd castes mix but little with the local people. They have a dialect of their own, and possess their own shrines at which they worship the gods who guard their herds. Each shepherd usually has 50 to 100 sheep but even the most intelligent flock-master is not able definitely to state the extent of his possessions. He believes that to enumerate his sheep is to play with fate, and that should he attempt to number them the gods will send disease and ravenous beasts to work havoc with his flock and thereby punish his presumption. Ten or more flock-masters generally combine to employ five or six shepherds to tend their united flocks, which may extend to 1,000 sheep. During the rains the sheep are taken to the higher grounds where the soil is comparatively dry, as, if they are allowed to graze on watery lands, "foot rot" is apt to set in. The sheep are tended night and day by the shepherds, as it is necessary to protect the flocks from beasts of prey. The shepherds live in the open like the sheep which they tend, and they say the sheep sicken if kept under cover. About 75 per cent. of the ewes give

lamba each year, of these the males with the exception of a few selected for breeding, are sold when one year old at about Rs. 2 each. The ewes are never sold or killed, if not carried off by disease or wild animals they live for seven or eight years.

Mr. Marten in his "Monograph on the Woollen Fabrics of the Central Provinces," observes that the shepherd caste does not seem to be distinguished from the various castes of agriculturists by any essential difference—the more so as the majority of its members are themselves engaged in agricultural pursuits—the care of sheep and the manufacture of blankets being only an additional means of livelihood. They are perhaps next akin to the Goths, Ahirs and other castes whose profession is the tending of cattle. It may be remarked however that the information given by Mr. Clouston is the more recent and may therefore be accepted as more applicable to the present day.

The Director of Agriculture reports that the average flock in Bengal contains about 80 sheep and that there is usually one ram to anything between 20 and 40 ewes.

The Director of Agriculture, Madras, reports that the flocks vary in number from 50 up to about 2,000 with a proportion of rams to ewes of one in 40. White sheep are not kept separately from black sheep nor is any attempt made to keep the breeding pure.

The Director of Agriculture says that sheep in Bombay are found usually in flocks of from 50 to something over 100, black, brown and white sheep being kept together. The proportion of rams to ewes is one to 50.

In the United Provinces the size of flocks varies from 200 downwards to as little as 10. Some flocks are composed only of white sheep and others of black sheep, but generally speaking flocks are mixed and there is no attempt to keep the breeds separate. Usually two to three rams are maintained per 100 ewes.

In Burma flocks are very small, averaging from 10 to 50 in number, and no attempt is made to keep white sheep separate from black.

In Bihar and Orissa the average size of a flock is said to be from 200 to 300 and, as is usual in other provinces, no attempt is made to keep types separately.

Flocks in the Punjab vary from 100 to 300 in size White sheep  
Punjab. are not kept separately from black, and there  
is no fixed proportion of rams to a flock The  
Director of Agriculture reports that there are often as many as 20  
rams to 80 ewes

## CHAPTER VII.

## PASTURAGE, ETC

This subject can best be considered according to the individual provinces

In Bengal, owing to the contraction and disappearance of grazing grounds in the neighbourhood of the villages, a result brought about by the gradual extension of cultivation, the proprietors of sheep are obliged to send their flocks to areas some distance from their homes. Usually the sheep are taken to the nearest jungles where they find grazing for about three months. They are taken away in October or November and brought back in January or February, when they are fed on the stubble left on the fields. During the rest of the year they feed on the grass that may be available on waste lands in the vicinity of villages. In other cases, from December to June, the sheep are put out to graze on fields where the crops have been already cut, chiefly on *char* lands, while during the rains they eat wherever they can find food. Hand feeding is rarely given and no shepherd ever thinks of growing green fodder for his sheep. In Bengal the owners have generally to pay for grazing, and for a flock of 100 sheep or more the fee paid is usually Rs 2 to 3 per season. There is also a custom of giving one sheep from each flock as the fee for grazing, whether the flock be large or small. There are many ryots, however, who are able to appreciate the manurial value of sheep folding and who even give the shepherd a small fee to ensure their land being grazed down periodically.

In Madras there are no regular pasturages for sheep nor are the flocks nomadic. Flocks are kept in and around particular villages and graze as best as they can on waste and fallow lands, sometimes starving in the hot weather. The landowner customarily pays Re 1 per day per 300 sheep in the south and per 200 sheep in the north to shepherds for folding their flocks on their fields for one night. From February to May inclusive, the flocks are grazed on the cultivated lands of the village after the harvests have been cropped, while from June to February



they are grazed on the waste lands. The grazing in the cotton fields before the stubble is removed is sometimes fairly good, but it does not last long. Grazing on waste lands is not usually good and only lasts as long as the rains continue, after which the sheep rapidly lose condition until the grazing on the cultivated land comes round again. No crops are grown specially for the sheep nor is any hand feeding done—the most concentrated form of food they ever get is green *babul* pods. The sheep are never housed; they are driven into their enclosure, usually of prickly-pear, every evening at dusk and out to the grazing grounds every morning. During the rains of the cold weather the mortality is therefore usually heavy.

In Burma the sheep are pastured on scrub jungles and on cultivated lands after harvest. The custom of folding flocks on a field for manurial purposes is hardly established in Burma for sheep, although it is recognised in the case of cattle and goats.

In Bihar and Orissa there are no recognised pasturages. The shepherds prefer, as grazing grounds, lands from which the *khesari* (*lathyrus sativus*) crop has been reaped, as a portion of the pulse falls in the process of reaping and is picked up by the sheep. For this reason, the sheep in Gaya migrate north to the *khesari*-growing lands in Patna in the beginning of the hot weather, and afterwards return to Gaya, going eventually to the hills in the rainy season. The value of sheep manure is recognised in the principal sheep-growing districts, and landholders are accustomed to pay the *gareris* for bringing their flocks to graze on their lands. The remuneration, however, cannot be considered liberal, amounting to no more than the food of two men per 100 sheep given twice a day, with a few pice in addition if there is any local competition for the services of the flock.

In Bombay shepherds wander with their sheep from one locality to another in search of fodder, but avoid wet tracts during the monsoon. A payment of five annas per night is made by cultivators to shepherds for penning 100 sheep on the field.

Generally speaking, the flocks in the Punjab are nomadic. In Kulu, Spiti and Lahoum the flocks of every owner have definite areas for their grazing. When the cold in the higher areas begins to destroy the grazing, the shepherds start moving their flocks towards the plains. It is

not uncommon, especially in the hills, for the owner of a well to offer free grazing for a night to the owner of a flock, so that the land around the well may be benefited by the sheep's manure. Occasionally he may even make a small payment for the purpose, but this is not common in the Punjab.

The shepherd's chief source of income in the Central Provinces is said to be the price paid for the manure of his flock, the cultivator paying in paddy to the value of about Rs. 2 or sometimes a little more per night during the season when the cane land is being manured. At this price the cost of manuring land by sheep folding is, Mr. Clouston observes, absurdly low, and he states that excellent crops of cane can be raised on land manured in this manner at a cost of Rs. 20 per acre. In a district like Chanda where ample grazing is said to be available at low rates, there would appear to be great scope for an extension of this practice. As leaders for the flock, the owner has invariably a few goats which show more activity and initiative in seeking new pasturage and are less timid than sheep.

In the United Provinces in some places there are recognised pastures for sheep, but generally the flocks are more or less nomadic. The custom of paying a fee to the shepherd for folding his sheep on a field is practised in these provinces, the shepherds being usually paid in gram about 5 to 10 seers per flock.

It may be of interest to record in this connection the number of sheep maintained to a given area in various parts of the world. In Europe, prior to the war, it was estimated that there were 50 sheep to the square mile, each 50 average about 212 lbs. of wool. In the United Kingdom there were in 1916 about 28½ million sheep or 258 sheep to the square mile, and the clip was estimated to yield about 121,000,000 lbs. of fleece-washed wool. In Australia there were, in 1916, 72,309,000 sheep, equal to about 24 sheep to the square mile and 170 lbs. of wool. In South America there are about 16 sheep to the square mile and 100 lbs. of wool. In the United States of America the sheep are estimated as numbering 12 head per square mile with 58 lbs. of wool, in Africa six sheep and 20 lbs. of wool to the square mile, and in Asia 6 sheep with 16 lbs. of wool to the square mile.

## CHAPTER VIII

## SHEARING

The custom throughout India is to shear twice a year, although in some provinces shearing is carried out three times yearly. Three clips a year is manifestly unsound, but can probably be attributed to the fact that the owner of the flock is a poor man and is anxious to realise money for his possession as rapidly as possible. Whether in the end he does not actually receive less for his total annual clip, owing to the extreme shortness of the staple obtained by three clips, is a point worthy of examination. But it seems probable that two clips a year are necessary in India to maintain the health of the sheep under present conditions, although with the establishment of new breeds of sheep in India we might eventually provide for an annual shearing only, as is common in other countries, thereby providing wool of a longer and more valuable staple. The custom in the various provinces is examined in the following paragraphs.

Sheep are generally shorn twice a year throughout the Bombay Presidency, most commonly in May and in November, though in places the period is later by as much as a month or more. Before the shearing, generally on the previous day, the sheep are washed without soap. In Kaira sheep are sent to be washed once a month, preferably in running water, which is supposed by the shepherds to lengthen the staple. The winter-grown fleece shorn about May is considered to be superior to the wool obtained at the November shearing, and always fetches a higher price.

In Madras sheep are generally shorn twice yearly but, as remarked in a previous chapter, most of the wool which comes into the market is the dead wool removed from the carcasses of slaughtered sheep.

Three shearings a year are generally carried out in Bihar and Orissa. In Gaya the sheep are sheared in the months of Chait (March-April), Sáwan (July-August), and Kartik (October-November). In this district, Chait is said to be the best month for shearing and Sáwan the next

best In other districts, the favourable months are said to be Asárh (June-July), Kartik (October-November) and Phalgun (February-March), i.e., at the beginning of the rains, at the beginning of the cold weather and at the beginning of the hot weather, and it is stated that the heaviest fleeces are obtained in Asárh though they are then the coarsest Phalgun shearing (February-March) is said to give the softest quality, but the smallest quantity of wool A description of the shearing given by Mr Bannerji may be summarised

Prior to shearing sheep are washed, no soap, soda or chemicals of any kind being used and the washing being generally done in a very superficial manner The sheep are then exposed to the sun for four or five hours and subsequently shorn If the day is windy, the sheep are taken into the shepherd's house for shearing, but otherwise they are clipped in the open field One man does the shearing himself and clips 8 to 10 sheep per day, although with small size sheep some men will do 15 in a day The animal is held between the shearers legs and the wool cut by a *hansua* or *hansuli*, a small instrument like a sickle consisting of a highly curved iron blade with a wooden handle Shearing is also done with a pair of scissors to a small extent but is said to be a very tedious process The wool is cut away in small pieces, no attempt being made to keep the fleece entire

Usually an auspicious day for shearing is selected by the village *pandit* The flocks are then led out to the shearing ground, when the whitest ewe is chosen for the first operation of the shearer A portion of the wool is then set apart and dedicated to the god of the shepherds, so that good luck may attend the shearing The shearers are fed at the expense of the owner of the flocks, the village *pandit* coming in also for a share of this

In the process of shearing, some cut out the different colours separately, but the usual procedure is to cut off all the wool together and subsequently to assort it into its different colours by women. In some places no sorting for colour is done at all In no case is any attempt made to sort into different qualities according to length and fineness

In the Central Provinces the sheep are shorn in some places  
 Central Provinces. twice and in others thrice yearly, usually in the months of Phalgun, Asárh and Kuar, corresponding roughly with the English months of March, July and October, respectively. Where two clips only are made, the hot

weather shearing is omitted and the sheep are then clipped immediately after the cold weather and after the rains. The best wool is obtained in the Phalgun shearing when the sheep are in robust health after the cold weather, the wool consequently being comparatively fine and long. In hot weather the sheep suffer from want of pasturage, and in the rains the wool is damaged by wet.

Before shearing, the sheep are washed and dried in the sun, in some cases the washing being performed every fortnight, and in these cases it is stated to improve the quality and promote the growth of the wool. Shearing is usually done with ordinary scissors, but in some districts (Chhindwara and Bilaspur for example) a flat sickle is used, which has the point turned upwards in order to avoid hurting the sheep. A man shears from 10 to 12 sheep per day, and if he works for hire gets 10 annas per score and a meal. The following remarks by Mr. Clouston as to the method employed by the sheep shearer may be of interest to those who are acquainted with methods in other parts of the world. "Laying the sheep on its side he squats down on his haunches behind the animal's back and holds it down by placing his left leg over its neck. There it is held as in a vice between his bare leg and the ground. In a very few minutes by a skilful manipulation of his scissors he has removed the fleece from one side. The sheep is then reversed and the other side clipped, the leg being applied to the neck as before."

Shearing in the United Provinces is in most districts carried out three times a year, namely in February, June and September, although in many cases the June shearing is dispensed with. The Bhutias of Garhwal are reported to shear rams three times a year but ewes only twice. The wool from the spring shearing of plains sheep is ordinarily the best, but in the hills sheep are used as pack animals through the winter months and consequently the fleece is greatly deteriorated when spring comes. The hill sheep are at their best during the rains on the *bugdals* or pasture grounds close to the snow line, to which they are sent in charge of a shepherd. Plains sheep are generally washed in the nearest river or tank before being shorn, although the process is very superficial, but hill sheep are not washed before shearing. The shearing is usually carried out with shears or large scissors, but in some districts an ordinary sickle or *pansua* is used by which the wool is taken off in tufts—a process which may be regarded as not altogether pleasant for the sheep. One man shears about 15 sheep

a day, and the owner of the sheep is expected to provide a feast, known as *mūka*, for shearers if they belong to his clan, otherwise, one-twentieth of the wool shorn is the usual wage

Mr Oliver devotes some space in his preliminary note on sheep-breeding experiments in the United Provinces to suggestions for the improvement of shearing operations and the care of sheep, which may be studied by those interested in the subject

The general custom in Bengal is to clip three times a year, namely  
 Bengal. in February-March, June-July and October-November

In the North-West Frontier Province clipping  
 North West Frontier usually takes place twice a year only, namely,  
 Province. in April and November

The usual custom in the Punjab is to clip twice a year, namely,  
 Punjab. in March and October, although in thorny tracts sheep are clipped thrice a year The Director of Agriculture reports that, owing to the rise in price of wool of late, there has been a distinct tendency to more frequent clipping

In Tibet the custom is to clip twice yearly, namely, in March and  
 Tibet October The wool which comes into Kalm-pong in the early part of the season, say from November to the end of January, may be said, generally speaking, to be wool which was shorn in the previous March, while the wool which arrives from February to the end of the season (June) represents the October clip

## CHAPTER IX

## YIELD OF WOOL

The small yield per sheep in India has been briefly mentioned in Chapter III, and as the conditions obtaining in the different provinces vary considerably, it is desirable to examine this subject separately for each province

In Mysore the best fleeces are said to weigh 3 to 4 lbs, but on an average the fleeces of Madras sheep weigh little more than one pound each

In Bombay weights per fleece vary considerably, but the average weight of fleece per clip is said to be only about one pound

The weight of a fleece in Bihar varies from half a pound to  $1\frac{1}{2}$  lbs, in some better types the fleece is said to weigh as much as 4 lbs, but it seems clear that the average weight of a fleece is roughly  $1\frac{1}{2}$  lbs

The weight of a fleece in the Central Provinces varies considerably. A large-sized ram will yield a fleece weighing as much as 12 ozs at one shearing, whereas in the case of small and poor sheep this weight represents the product of two or even three shearings. Mr Clouston remarks with regard to the Chanda district that no accurate information is available as to the quantity of wool obtained from the sheep. The owner speaks of getting a large handful from two shearings and estimates that a year's clip is worth about four annas only, although at present prices this value would probably be nearer eight annas

In the United Provinces the weight of the fleece varies from about 6 ozs in the case of an ordinary plains sheep to 24 ozs to 28 ozs in the case of the best yielding sheep. Taking an average for the United Provinces, Mr Pim in his monograph says that the annual yield of wool cannot be more than  $1\frac{1}{2}$  lbs per sheep. The Director of Land Records and Agriculture mentions 4 ozs to 8 ozs per sheep as being the average present yield. Experiments made by the Civil Veterinary Department, to which reference has already been made, show the possibility

of rapidly increasing this yield. From the half-breds Mr Oliver obtained 2½ lbs at the first shearing, 3½ lbs at the second shearing and 5 to 6 lbs per animal when two years old. He anticipates that an average of 7 to 9 lbs will be obtained eventually in the full grown animal.

In Bengal the average weight of a fleece is said to be approximately 8 ozs, while in the North-West Frontier Province, the fleece varies in weight from 1 lb to 2½ lbs.

It is interesting to observe in this connection the weight per fleece in Australia and the manner in which it has grown. The average weight per bale may be taken as 320 lbs.

TABLE 1—*Average weight of Australian fleeces*

Year	Number of fleeces per bale	Average weight per fleece
		lbs
1896-1897	59 65	5·36
1897-1898	60 08	5·32
1906-1907	49 65	6·44
1907-1908	51 72	6 19
1913-1914	41 56	7 79
1916-1917	42 41	7·56

It should be explained that these figures include scoured wool, as also lambs.

The growth of the weight per fleece in the United States of America may also be noted as an encouragement to India. In 1840 the average weight of a fleece was barely 1 85 lbs, in 1850 it was 2 42 lbs, in 1860, 2 68 lbs, in 1870, 3 52 lbs, in 1880, 4 79 lbs, and in 1887, about 6 lbs.



## CHAPTER X.

## TREATMENT OF RAW WOOL

In Bengal and Bihar and Orissa, where the sheep cannot be washed before shearing, washing is carried out soon after, and foreign matter, such as thorns and burrs, seeds, etc., removed by hand. If the wool is intended to be used for the manufacture of domestic necessities, such as blankets, the wool is then scutched or bowed generally by the women. If, however, a fairly large quantity has to be dealt with, the scutching is done by professional *dhunyas* or carders. As a rule about half a seer of wool is scutched at one time, and the work is very tedious. The scutching is done by means of a bow similar to that used in cotton scutching, but it is called by a different name, "Pijan." The scutched or carded wool is then lightly rolled by the hands into small rolls, preparatory to spinning.

In the Central Provinces the wool is cleaned by hand from the dirt and foreign matter mixed with the wool, but no sorting takes place with regard to difference of length or quality of staple. In the Hoshangabad Report, the wool is said to be scoured and unshed by hand and treated with an infusion of *teora*. The carding is done as in the case of cotton with a bamboo bow, and the process is usually carried out by a *panjara* or a professional cotton carder. The *panjara* uses an instrument larger than the ordinary shepherd's *kamtha*—it is usually suspended to the ceiling, and the vibrations produced by the blows of a hammer or *pinjan*. There is said to be a caste prejudice amongst the shepherds against the use of the *pinjan*, but a more probable explanation of their adherence to the simple *kamtha* is that, though the work is slower, the wool is better carded by their smaller hand instrument. A *panjara* can card two seers of wool per day and gets three or four pice per seer, while a shepherd with his small instrument gets through only half a seer per day. The wool after carding is made up into small bundles or rolls, termed *punis*, about 3" long, and is then ready for spinning.

In Bombay the carding is done by a *panjara* as in the case of the Central Provinces, and the charge for carding is said to be approximately one anna per seer.

Bombay.

In the Punjab, at the main market of Fazilka, there is a certain amount of machinery for cleaning wool prior to export, particularly with a view to freeing the wool from burrs, but the wool is more ordinarily cleaned for this purpose by hand clipping done by women. Hand clipping is said to be preferred where a good quality of wool is desired, and the charge is  $2\frac{1}{2}$  annas for 5 seers. There are three small works at Fazilka, each with two machines, for freeing wools from burrs, and the charge made is Rs 2-4 per maund. If the wool is very dirty it is washed by feet on the open ground near a well, the charge for this being two annas per maund to the worker and half anna per maund to the owner of the well, but when prices are high it is no uncommon thing to see wool actually being sanded in order to increase weight. The wool at this market being almost entirely for export or consignment to the Indian mills, carding is not carried out.

Punjab.

In the United Provinces sorting of the wool into qualities is not ordinarily observed, but in some cases there is an attempt to separate black from white wool, and the worst staple is occasionally picked out to be set aside for the stuffing of saddles and similar purposes. Washing of the wool is uncommon and soap is never employed, of course in the case of hill wool, which contains a fairly large proportion of yolk or grease, it is necessary to remove this before use can be made of the wool, and in Garhwal it is soaked after shearing, first in hot water and then in cold, after which it is beaten with a stick (*tagsa*) split up half its length. Where the wool has been grown in tracts abounding in thorny undergrowth or in burrs, these impurities have to be removed by hand picking. The workers are usually women and the wages very low, being in some cases barely one anna per day. Scutching or carding of wool by hand is done in exactly the same manner as with cotton. In the manufacture of common blankets, the *gacris* carry out the work of carding themselves, using an ordinary bow, the string of which is made of gut or hemp. But if large quantities of wool are required, as in the case of the Mirzapur carpet industry, the wool is cleaned and carded by a professional *bēlna*,

United Provinces.

usually a Muhammadan. The instrument employed by him, known as the *dhunhi* or *pinja*, consists essentially of a heavy bow suspended string downwards, with the string some 6" from the floor. The wages of the *behna* or *dhunna* are very low, varying from half an anna to one anna per seer, and he does not usually earn much more than two annas per day. The carded wool is made up into small balls, termed *puns* or *galas*, weighing about 2 ozs each.

## CHAPTER XI

## FINANCING OF THE WOOL TRADE.

In India the rearing of sheep and production of wool are not ordinarily taken up as an industry by the moneyed classes, as is the case, for example, in Australia, where the industry is in the hands of big sheep farmers who maintain large flocks and apply scientific methods to breeding. In India, on the other hand, the industry is almost entirely in the hands of small shepherds who are both poor and ignorant. Hence the necessity for the middlemen or small wool merchants who take over the wool from shepherds with small flocks. In order to ensure supplies, these middlemen have to make monetary advances to the shepherds six months, or even earlier, before the actual season of clipping. The percentage of this advance depends upon the credit of the particular shepherd and his relations with the merchant, but usually it amounts to approximately 50 per cent of the total price agreed to be paid. It will thus be seen that the shepherd himself gets little or no advantage when wool is at a comparatively high price, as the merchant naturally pays the shepherd on the lowest basis known to him, and the shepherd is in the hands of his financier.

These merchants, having taken over the wool from the shepherds, then consign it to one of the principal markets for sale outright there, although some of the larger merchants in this trade eventually consign the wool for sale at Liverpool on their own account. But, generally speaking, the merchants who take over the wool from the shepherds send it to internal markets like Fazilka for outright sale. Where the wool is not purchased on behalf of Indian mills, it is taken up by exporters who may or may not clean it and who may or may not adulterate it. As a rule, these merchants are not men of large capital, and the financing is done by exporting firms in Bombay and Karachi on the pledge of a guarantee broker, who is responsible to the export house at the port for any loss which may occur from the merchant failing to repay any part of the advance, in case the wool

realises less at Liverpool than the amount advanced. The amount advanced upon the wool depends largely upon the credit of the merchant and the faith reposed in him by the guarantee broker—ordinarily it is 70 per cent to 80 per cent, but in a rising market the advance sometimes exceeds the actual expenditure by the merchant.

Omitting a certain quantity of Tibet wool purchased at Kalimpong and subsequently exported from Calcutta to the United States of America, practically the whole of the wool marketed in India and subsequently exported is forwarded to Liverpool for sale, and it may be of interest at this stage to describe the method of sale at Liverpool.

Although the wool goes forward ordinarily in the name of one of the large exporting firms, it remains the property of the Indian consignor or merchant. **The Liverpool sales.** As already mentioned, he receives from the exporting firm, through the medium of the guarantee broker, an advance of the agreed upon percentage of estimated value, this being paid to him in rupees on a basis of a sterling bill at 3 months' sight. Freight and insurance are arranged by the exporting firm. In pre-war days the wool on arrival in Liverpool was warehoused, valued—the valuation being ordinarily communicated to the exporting firm by cable—and finally sold at public auction. No wool could be sold by private treaty until it had first been offered at auction. An account sales was then made out, and the exporting firm had the material for effecting a final settlement with the merchant on whose behalf the wool was shipped. The exporting firms charge a gross commission of 3 per cent in Bombay and 4 per cent in Karachi, of which 1 per cent is returned to the consignor in the final settlement of the accounts. Out of the remaining 2 per cent in Bombay, or 3 per cent in Karachi, a brokerage of 1 per cent is paid, so that the nett interest of the exporting firms in the transaction is limited to a very small percentage.

During the war period, however, ordinary sale by public auction at Liverpool was stopped, although the normal methods of the trade as between the final purchaser and the consignor in India were maintained throughout. The wool was taken over by joint valuation at Liverpool on the basis of the market prices established on that day and subject to any changes in freight rates. Freight was arranged by consignors as usual, but Government received a rebate from the ship-owners of any difference between the rate

actually charged and the Admiralty rate. If Government undertook the insurance, as was common during the war, the merchant returned to Government the insurance premium charged to the consignor on the invoice value, Government undertaking to pay the merchant on the Liverpool valuation should the wool be lost or destroyed by any of the risks covered. The valuations at Liverpool were made by a broker acting for the merchant and a broker acting for Government and in the event of their failing to agree, the decision of a third broker was considered final. Payments were made in cash 11 days after the date of the agreed valuation.

The Director of Raw Materials with the War Office, London, has kindly supplied the following particulars with reference to the procedure which is in force at Liverpool, at the time of writing, for handling East Indian wool —

“The wools are distributed through the usual channels of the trade upon a system as far as possible approximating to the system of sale by public auction which prevailed prior to the Department's scheme of control. The fundamental difference is, however, that instead of the sale being accomplished by competitive auction, in place of the latter is substituted a system of distribution by public sales at fixed prices carried out in the following manner —

- (1) Prior to the date fixed for the distribution sale, the wool is divided up into a large number of lots. These lots are usually smaller than those which prevailed under the old system, to facilitate an equitable distribution. A catalogue is prepared in the normal manner and each lot is valued upon the Department's fixed scale of prices by an Appraisement Committee representing both the selling and the buying interests. In the event of a dispute with regard to the valuation of any lot, appeal is made to the Department's Officer in charge of East Indian wool distribution. The price of each lot is then entered in the catalogue.
- (2) The lots are then set out for the inspection of the intending buyers, wherever possible in the bale, but where this is impossible, as in cases of shipments diverted to out-ports such as Hull, etc., they are represented

by large type samples. Intending purchasers are then allowed to examine the actual lots of samples in conjunction with the prices required under the Department's price list, selecting as far as possible the wools most suitable for their purpose.

- (3) On the date of the distribution sale, each lot is put up separately, but instead of competitive bidding and the lot being sold to the highest bidder, intending purchasers signify their willingness to take the lot by lifting up their hands. In the event of more than one offer being made for a lot, it is allotted to a particular buyer by the auctioneer in consultation with the Department's Officer in charge of distribution. It should be understood that only manufacturers engaged upon Government orders can participate in these sales, and authority to do so is granted by licences issued from the Branch of the Department responsible for the contracts. It is the work of the Department's representative to see that no buyer has allotted to him at the sale more than the amount for which he holds the necessary certificate."

## CHAPTER XII.

## PRICE OF WOOL

The following table shows the average prices of the principal growths of East Indian wool in the Liverpool market in the years 1911 to 1917.

TABLE 2 — *Average prices for East Indian wool in the Liverpool market from 1911 to 1917*

(Pence per lb)

Principal growths	1911		1912		1913		Schedule fixed December 1916
	June	Dec	June	Dec	June	Dec	
Bikaner—	<i>d</i>	<i>d</i>	<i>d</i>	<i>d</i>	<i>d</i>	<i>d</i>	
White	10½	10½	11½	11½	12	12½	22
Yellow	9½	9½	9½	10½	11	11½	18½
Joria—							
White	11	11½	12	12½	12½	13	20½
Yellow	9½	9½	10	10½	11	11½	17½
Kandahar—							
White	9½	9½	9½	10½	10½	11½	16½
Yellow	7½	7½	7½	8½	9½	9½	15
Marwar—							
White	6½	6½	7	7½	8½	8½	14½
Yellow	5½	5½	6½	7	7½	7½	12
Native—							
Black	3½	4	4½	6	6½	6	13
Grey	2½	2½	3	4½	3½	3½	7½

After the outbreak of war, prices for all qualities rose sharply (freights rose from say Rs 25 to Rs 375 per ton), and in December 1916, the War Office (Contracts Department) intervened. The next column gives the fixed schedule for good average parcels from which the brokers in fixing prices work downwards according to condition, length, etc

The price of Kandahar wool at Karachi was Rs 35-8 per maund in 1873 and Rs 38 per maund (=8½*d* per lb) in 1917. There have, however, been many fluctuations between, and this type of wool was priced at Rs 16 (=3½*d* per lb) in 1902. This corresponds roughly with the movement of the world market. A similar type of wool, though scoured, was priced in London at 20*d* per lb in 1873, being quoted at approximately 11½*d* in 1892, at 8*d*. in 1902 and at 20*d*. in 1916.

Comparison between British and Indian prices.



The British domestic clip for 1917 was taken over as a war measure by the British Government at values 35 per cent above the average rates for the 1914 season's production, but for the season 1918 this rate was raised and the wool paid for at 50 per cent above the 1914 prices

During 1918 the first cost of genuine Bikaner wool as marketed at Fazilka was about 13 annas per lb. The black and grey wools common to the North of India sold at about 9 annas per lb, and ordinary Tibet wool was priced at 8 annas per lb. These prices are of course for the wool in its original condition, without washing or cleaning.

The all-round price at which the Australian wool outturn, with the exception of the comparatively small quantity consumed in Australian mills, has been taken over by the British Government up to 30th June, 1920, is 15½*d* per lb, this representing 55 per cent above the average pre-war price. Under this buying scheme, however, all the wool is appraised by valuers, and many lots of wool have been paid for at over 27*d* per lb in the grease.

The following particulars as to the Australian clip during the season 1916-17 may be noted —

TABLE 3 — *Particulars as to Australian clip in 1916-17*

	Bales of 320 lbs sold
Merino . . . . .	1,269,340
Cross breeds . . . . .	947,241
	2,216,581
Greasy . . . . .	2,005,293
Scoured . . . . .	211,288
	2,216,581
Fleece wool . . . . .	2,063,720
Lambs . . . . .	152,861
	2,216,581
Total value of above wool . . . . .	£ 45,631,102 0 0
Average value realised per bale . . . . .	20 11 8
Average for the past 14 years . . . . .	13 18 4

South African wool, which does not come under the British purchase scheme as a whole, averaged 13 67d per lb for the season ended July 1918—but this wool is not so good as average Australian

The prices of Indian wools given in Table 2, page 47 apply of course to the wools as they reach Liverpool, prior to which they have undergone a certain amount of sorting and cleaning, and the names under which they are marketed are trade names rather than distinct names

There is considerable divergence of opinion as to what the future of wool prices is to be. Whilst those interested in the sale of wool generally hold that enhanced prices are likely to exist for a long time to

The future of wool prices.

come, due to the depletion of stocks in manufacturing countries, others are more disposed to regard a fall in prices as probable because of the stocks which are known to have accumulated in wool-growing countries. It is impossible to get complete or reasonably accurate figures, but there is no doubt that stocks of wool in Australasia, South Africa and South America have accumulated to a large extent. It was announced by Reuter's correspondent a short time ago that 1,200,000 bales of wool were stored in Australia at the end of June, 1918, and it was recently officially announced that new stores which are to be built at the principal capital ports of Australia for the storage of Government-owned wool will have a total capacity of 2,500,000 bales of wool (a bale representing approximately 320 lbs of wool). An unofficial report received from South Africa in the latter half of 1918 estimated the quantity of wool held in that country then to be 250,000 bales, and the new season's clip was expected to produce a further 500,000 bales. As regards the position in South America, it is said that, at the end of June, 1918, a considerable quantity of the 1917-18 clip remained unsold, and it was regarded as improbable that the stocks of old wool would be disposed of before the arrival of the new clip. The cause of this great accumulation of wool at the sources of supply is, of course, the scarcity of shipping. Such wool as has been brought to the United Kingdom has been utilised almost entirely for military purposes and shipping on private account has been out of the question. The disposal of accumulated stocks of wool, held in a large degree to the orders of the British Government, will presumably engage the early attention of the Wool Council in the United Kingdom, now that the needs for war purposes

have diminished so greatly, and it is expected that actual particulars as to stocks will then be published. With these available, it will be possible to estimate more closely the likely trend of prices of wool, and East Indian wool will be governed thereby

The Statistical Committee of the Wool Council recently issued the following preliminary estimate of world stocks, production and consumption of wool during the next two years.

TABLE 4 — *Wool Council's estimates of world's stocks, production and consumption of wool during 1919 and 1920*

	Weight 000,000 lbs of greasy wool
Present world stock . . . . .	1,265
Add estimated production for 1919 . . . . .	2,673
	3,938
Less estimated consumption for 1919 . . . . .	2,020
TOTAL	1,318
Add estimated production for 1920 . . . . .	2,700
	4,018
Less estimated consumption for 1920 . . . . .	3,094
Estimated stock at end of 1920 . . . . .	924

## CHAPTER XIII

## WOOLLEN MANUFACTURE IN INDIA

The number of woollen mills at work in British India in 1902 was three with an authorised capital of Rs 38,50,000, and employing 23,800 spindles and 624 looms. The number of persons employed in the industry then was 2,559, and the quantity of woollen goods produced 2,118,000 lbs. At the end of 1917 the number of mills had risen to five, with an authorised capital of Rs 2,56,50,000, employing 39,608 spindles and 1,155 looms. The weight of goods produced then was 9,744,264 lbs and the number of persons employed 7,824. With regard to Indian States, there was one mill in Mysore in 1903, with a capital of Rs 6,00,000 employing 1,130 spindles and 45 looms. The quantity of goods produced was 1,136,000 lbs and the number of persons employed 297. In 1907 there was still only the one mill working in an Indian State—the authorised capital had been increased to Rs 15,00,000 the quantity of goods produced to 1,721,087 lbs, and the number of persons employed to 563. Three of the mills manufacture all classes of woollen and worsted goods, the remainder manufacturing blankets only. The existence of these mills in India proved of great service to Government in the meeting of war requirements, and they were all employed to their fullest capacity in supplying army demands for greatcoat cloth, serges, putties, flannels, blankets and hosiery. Their total capacity, however, was not sufficient to meet the full requirements of the army, and consequently their supplies had to be supplemented by large imports from home. The bulk of the wool used by the Indian mills is Indian wool, although it is supplemented to some extent by the importation of merinos and cross-breds from Australia for the manufacture of the finer classes of goods. Their market for manufactured goods is almost entirely in India itself.

Some idea as to the quantity of wool used on active service may be gathered from particulars of the woollen articles furnished to the Indian soldier.

TABLE 5—*Woollen articles supplied to an Indian soldier*

No	Kind of article	Approximate weight	
		lbs	ozs
1	Blanket	1	12
1	Greatcoat	6	10
1	Blouse	3	8
1	Knickers	1	12
1	Jersey	1	8
1	Pair of putties	0	10
2	Pair of drawers	2	0
2	Undervest	2	0
2	Shirts	1	8
2	Pairs of socks	6	9½
1	Balaclava cap or comforter	0	6½
1	Pair of mittens	0	4
TOTAL		28	8

Allowing for losses in manufacture, and loss in scouring from greasy weight, this may be taken as representing as nearly as possible 100 lbs of raw wool as shorn per man

There is in India a certain amount of manufacture by hand which has existed for very many years. The chief products are numdas or felts, blankets and carpets, to which may be added the manufacture of puttoo and pashmina, mainly to be found in Kashmir. The hand-loom weaving of woollen goods is generally done with hand-spun yarn, although there has been for some years past a fairly large import of machine-spun yarn from abroad for the manufacture mainly of shawls in the Amritsar district, and Indian mill-spun woollen yarn is used to some extent in the manufacture of the better classes of carpets. The spinning of the woollen yarn by hand is generally done on a spinning wheel like that formerly used for the hand spinning of cotton, and known in the vernacular as the "charkha." The shepherds whilst



It is only the initial cheapness of the indigenous product that permits of its retention even amongst the poorest classes, with whom in the cold weather a blanket is a necessity. Blankets are ordinarily woven in the villages in very narrow strips of 15"-16" widths, subsequently being sewn together, and the quality is very coarse. At Odra, in Aurangabad, a certain number of blankets of superior quality are however made.

Jail-made blankets are now being turned out in Bihar and Orissa, as in other provinces, the Bhagalpur jail making a speciality of them, and, generally speaking, they are superior to the blankets produced on hand looms by private enterprise. These latter are usually disposed of at the local *hats* or fairs where there is generally a sufficient demand to take up the whole of the local supply.

Blanket weaving in the Central Provinces is again almost the only item of woollen manufacture carried out, Central Provinces. the industry being very largely conducted by women as a subsidiary employment. Here it is common to size the woollen yarn with tamarind liquor, which accounts for the board-like character of the blankets as sold. The work is carried on only in the hot weather, and it is said that the March shearing of wool is the best. The amount of wool produced annually in the Central Provinces is said to be insufficient for local needs, and consequently manufactured blankets are imported from elsewhere. Mr C E Low, I C S, in his Industrial Survey of the Central Provinces and Berar, thinks that the present caste of wool weavers, who are as a caste shepherds first and weavers only incidentally, are not fitted to establish an improved wool weaving industry. The following remarks by Mr G A Davies of the Bengal Educational Department, when acting as Judge at the Central Provinces and Berar Exhibition, are quoted as being of interest.—

“*Woollen goods and hosiery*—In this direction considerable advance appears to have been made of late years. Some of the blankets exhibited were of very good appearance and quality, but here again we have the bazar with its cry for a cheap article which retards progress. Blankets of a very good class can be made on hand-looms but two considerations have to be met. Firstly, a loom of a proper description is an expensive item; secondly, for a blanket of good appearance, considerable care must be

expended on the yarn spun. The ordinary blankets made in strips sewn together made of dirty yarn, exceedingly coarsely spun, give weight and warmth combined with cheapness, and such find a ready market among the poorer classes. Probably with proper hand-looms and a little care exhibited in yarn spinning, an equally warm clean blanket of half the weight could be supplied at the same cost, but the purchaser would feel that he was not obtaining full weight for his money. In such a blanket there would be a considerable saving of material, but there would be increased labour charges both in spinning and in weaving as the yarn would be lighter and the texture closer. In spite of the objection above noted as being probable on the part of a purchaser, I am convinced that a medium quality of blanket properly made on a suitable hand-loom would find an increasingly rapid sale year by year, more especially if they could be made in brilliant colours such as the people love."

These remarks have been quoted because the Central Provinces have recently engaged an expert in woollen manufacture to direct and instruct the people in the hand manufacture of woollen goods, and already some very creditable tweeds are being made, in addition to improved blankets.

Carpet manufacture is the leading woollen industry of the Punjab, and Amritsar is the chief centre, but blankets, Punjab. numdas, puttoos and shawls are also made to a fairly large extent.

Amritsar had a considerable trade at one time in weaving shawls from *pashm*, the fine under fleece of the Tibetan goat, but this industry rapidly declined after the Franco-German war. Its place has been taken to some degree by the manufacture of shawls from imported worsted yarns, but more generally by the manufacture of carpets of a fine quality which find a ready sale in the world market. This work is done entirely on hand looms and the carpets fetch a high price.

It may be remarked here that the shawl industry appears to have grown mainly with the dominion of Ranjit Singh, and received a great impetus about 1873, when a number of Kashmiri weavers left their own district owing to famine and settled in Amritsar, and



the products from that area were supplied to Hyderabad, Lucknow, Delhi and the States of Rajputana. An export trade began immediately after the annexation, and at one time 4,000 looms are said to have been at work in Amritsar. This trade however has died out.

In normal times there are about 800 weavers now engaged in the carpet-making industry, although at the present moment there are only about 600 people employed with about 135 looms, the bulk of the outturn going to the United States of America. For cheap qualities of carpets country and lined wool are used by some manufacturers but, generally speaking, only the better qualities of carpets are made in Amritsar, for which Bagri or Bikaner wool is used. Tibetan wool is used for still finer qualities, first grade Afghanistan wool for high-grade carpets, and in special cases *pashmina* is also used. Generally speaking, wages are upon a rather high level in Amritsar, which cannot therefore compete with Mirzapur in the United Provinces, which has become an important centre for carpet making. Amritsar carpets fetch on the average about Rs 15 per square yard.

Numdas, blankets and carpets are the chief woollen industry of the United Provinces. The demand for numdas has suffered to the extent that it has been replaced very largely by cheap leather saddlery, and the manufacture therefore, is now almost insignificant. Coarse, loosely woven blankets are made in almost every district of the province and generally suffice for local needs, but here again the price which the consumer is willing to pay governs the quality. Blankets of a better grade are made in some villages in Bahraich and in the districts of Muzaffarnagar, Meerut and Bijnor. A very considerable industry in the weaving of army and horse blankets now exists in these districts, which were fully exploited in meeting the demands for army purposes during the war. The use of woollen clothing is naturally much more extensive in the hill districts than in the plains, and in the uplands of Almora the Bhotias weave a puttoo of very fair quality, while rough soft coloured rugs are also woven in fairly large numbers. The local supply of woollen goods is, however, very much less than the demand, and consequently there is a large import monthly of blankets and rugs from the Punjab and Eastern Kashmir.

The manufacture of woollen pile carpets has now been established on quite a large scale in the district of Mirzapur, whence it has spread to the adjoining districts of Jaunpur, Allahabad and Benares,

There is also a fairly well established carpet industry in the Agra district. The carpets manufactured in the smaller centres are generally of inferior quality and are sold for use in India. But with the establishment of carpet manufacture upon an organised scale, a large export trade has been created, for which London is the principal market and centre of distribution.

The industry is mainly what might be termed a cottage industry. The firms controlling the trade give out the yarns with instructions as to the designs which are to be made, and the weavers are paid for the carpets on completion. The weavers are of all castes, both Hindus and Muhammadans, but while carpet weaving is in the case of a Hindu generally an occupation subsidiary to agriculture, the Muhammadan carpet weaver follows no other calling. Normally it is estimated that about 15,000 work people are employed in this industry in the United Provinces, but at present only about half that number are working. Of this number approximately two-thirds are boys. Besides actual weavers there are approximately another 4,000 persons both male and female indirectly connected with the industry and the number of looms is stated to be about 3,000. For the ordinary make of Mirzapur carpet, hand-spun yarn is used, the districts supplying the wool being Jhansi, Datia, Gwahor, Gaya, Etawah, Gorakhpur, Arrah, Ballia and others, but for the better qualities of carpets machine-spun yarn is obtained from Indian mills. Before the war, the Mirzapur carpet was sold in the bazars at rates down to as low as Rs 2 per square yard, although this was naturally for a very inferior quality. The more usual types were sold at about Rs 4 per square yard, but high-class qualities ranged up to Rs 15 per square yard. Due to the great advance in the price of wool, to the impossibility of obtaining mill-spun yarns (which were all taken up for the supply of army needs) and to export restrictions, the trade has suffered severely during the war, but there is reason to believe that with the resumption of normal conditions this industry will prosper once more.

In the North-West Frontier Province there is a fairly large industry in the manufacture of puttoos, the chief centres being Mansehra, Bhogarmang and Data. Coloured felts or numdas are made, though not very largely, in the Kohat and Hangu tehsils, but the best qualities come from the independent Waziris on the Kohat frontier beyond the frontier lines. Woollen camel bags similar to

those made by Baluch women are also woven in the district, but the greater part of those used are imported from the independent Waziri and Ghilzai tribes. Rough woollen *nalkhais* (rugs) and *taghars* (durries) are made by a few Marwat weavers in the Bannu district, but the supply is very limited.

Woollen pile carpets are made in the Bangalore district. White *dawalis* and coating *lamlis* are prepared at Mysore. Satanur, near Mandya, and *lamlis* of good quality are manufactured at Davanagiri, Cheknayakanahalli and Yellanadu.

## CHAPTER XIV

## EXPORT OF WOOLLEN MANUFACTURES.

The export of manufactured woollen goods by land from India was valued at Rs. 6,86,590 in 1914-15, but Exports by land, decreased to Rs. 1,71,027 in 1916-17, the chief decrease being found in the exports to Peshawar States, Western China, Nepal and Tibet. The reason obviously was the heavy demand made upon Indian manufactures, both mill-made and hand-made, to be used for war purposes. Prior to the outbreak of war, there was a fairly large export of better quality cloths to Afghanistan, much of it from Kashmir, but with the heavy increase which took place in price practically nothing has been sent of late.

A certain quantity of woollen piece goods are reported to have been sent into Nepal from districts in Bihar and Orissa—the classes of goods reported being mainly blankets, puttees and serge. The returns of exports of manufactured woollens have not always distinguished between foreign-made and Indian-made goods, but it is of interest to note that German tweeds and flannels of inferior quality, German broad cloth mainly in black and red colours, and a certain quantity of so-called home-spuns imported from Germany are reported to have been exported to Chinese Turkestan and Tibet from India. Turkestan and Tibet ordinarily import a moderate amount of Kashmir-made woollens, but during the period of the war owing to high prices, very little indeed has been exported.

India has not a large trade in the export by sea of woollen manufactures, the chief goods exported being carpets, Exports by sea, rugs and shawls. In carpets and rugs our chief customers are the United Kingdom, United States of America, South Africa, Australia and New Zealand. Germany and France were also fairly good customers in pre-war times, but the export to the former has naturally ceased, while to the latter it has become insignificant. The United States of America is a large importer of carpets and rugs from India, and even during the war period its imports have continued to increase. The Indian-made carpet has, under the influence of certain large organizing firms, been improved and standardized in quality, and it is probable that the export of Indian-made carpets will continue to increase, as the

conditions of carpet manufacture are such that India ought to be able to hold a prominent position as a world supplier. Exports of woollen piece-goods are virtually negligible, the total quantity exported being less than 10,000 yards. The trade in shawls, which was never very much, has fallen off during the war period, the total number exported being 80,450 in 1908-09 and 3,033 in 1916-17.

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## APPENDIX No 1

## PRESENT WORLD PRODUCTION OF WOOL

—	Total pro- duction	Merino	Cross-bred	Carpet, wool, etc
<i>British Empire</i>	lbs	lbs	lbs	lbs
United Kingdom	122,000,000		122,000,000	
Australia	570,000,000	484,500,000	85,500,000	
New Zealand	197,000,000	6,000,000	191,000,000	
Cape	180,000,000	180,000,000		
Falkland Islands	4,000,000		4,000,000	
Canada	11,000,000	5,500,000	5,500,000	
British India	60,000,000			60,000,000
<b>TOTAL BRITISH EMPIRE</b>	<b>1,144,000,000</b>	<b>676,000,000</b>	<b>408,000,000</b>	<b>60,000,000</b>
<i>Other Countries</i>				
France	79,000,000	15,800,000	63,200,000	
Russia	380,000,000	76,000,000		304,000,000
Italy	21,000,060	15,750,000	5,250,000	
North America	304,000,000	174,000,000	130,000,000	
Spain and Portugal	62,000,000	31,000,000	31,000,000	
South America	404,000,000	73,000,000	331,000,000	
Other countries	338,000,000			338,000,000
Germany .	25,000,000	5,000,000	20,000,000	
Austria Hungary	42,000,000	8,000,000	34,000,000	
<b>TOTAL OTHER COUN- TRIES</b>	<b>1,655,000,000</b>	<b>398,550,000</b>	<b>614,450,000</b>	<b>642,000,000</b>
<b>GRAND TOTAL</b>	<b>2,799,000,000</b>	<b>1,074,550,000</b>	<b>1,022,450,000</b>	<b>702,000,000</b>

## APPENDIX No. 2.

## PARTICULARS OF IMPORTS OF RAW WOOL INTO INDIA BY SEA FROM 1912-1918.

From	Quantity							Value				
	1912-13	1913-14	1914-15	1915-16	1916-17	1917-18	1912-13	1913-14	1914-15	1915-16	1916-17	1917-18
United Kingdom	118,000	129,503	11,070	50,510	378	102	24,330	19,331	2,385	4,387	106	13
Africa and Dependencies	1,194	1,920	0,072				35	117	2,178		33	107
Bahia Islands	10,170	28,170	7,102	1,701	1,212	1,581	137	647	206	111		..
Cape Colony					10,711		517					
East African Protee torie	17,105						21,217	24,639	14,765	31,148	35,545	1,333
Victoria	130,850	101,083	285,701	500,788	121,157	100,800		2,980	1,362			
New South Wales		28,770	10,711				23,247	27,625	10,667	31,118	35,545	1,333
Australian Common wealth	130,850	522,850	200,102	500,788	121,157	100,800	38	4	8			11
Other British Posses sions	1,565	001	1,212			6,880		47,724	21,638	35,510	37,494	1,403
TOTAL BRITISH EMPIRE	018 113	870,111	100,558	011,012	111,778	110,050	18,640					057
Turkey Asiatic— Red Sea											971	057
Persian Gulf	1,012	20,208	11,012	50,221	170,212	10,301	168	618	1,638	1,121	0,534	1,009
Muscat Territory and Trucial Oman	12,500	101,118	101,012	101,585	111,800	181,720	606	1,033	2,090	9,113	2,192	3,000
Other Native States in Arabia	100 218	10,111	18,502	115,509	100,702		4,821	313	113	8,607	12,134	..
Persia	2,501,810	2,712,200	2,078,010	1,510,299	2,812,013	2,280,011	86,068	82,603	83,165	106,925	107,415	78,415
Other Foreign Countries	2,800		108	01	15	10	87		3	1	1	1
TOTAL FOREIGN COUN TRIES	2,707 170	2,871,000	2,007,101	4,071,600	1,011,000	2,510,115	80,350	85,167	87,945	119,427	129,477	83,748
GRAND TOTAL	3,735,003	3,710,401	3,316,763	4,708,701	4,076,084	5,051,071	134,990	139,891	109,583	154,971	166,971	95,311

## PARTICULARS OF IMPORTS OF RAW WOOL INTO INDIA IN 1915

Countries from which imported	1915 16			1916 17			1917 18		
	Quantity	Value		Quantity	Value		Quantity	Value	
		R <sup>a</sup>	P <sup>a</sup>		R <sup>a</sup>	P <sup>a</sup>		R <sup>a</sup>	P <sup>a</sup>
Lus Behl	cwt 20,796	1,01,076		cwt 9,479	2,91,741		cwt 12,018	3,30,869	
Khelat	10,085	3,07,977		7,659	2,05,027		7,242	2,28,712	
Persia	731	29,118		529	23,558		975	10,185	
Afghanistan—									
Northern and Eastern	34,610	18,47,277		37,400	21,91,878		42,027	28,71,106	
Southern and Western	146,162	95,98,991		108,406	83,31,119		86,126	61,96,187	
Tirah	1,196	29,647		1,226	41,000		777	28,652	
Dir, Swat and Bajaur	2,921	71,585		620	20,232		907	32,736	
Waziristan	4,140	1,59,118		4,441	1,86,701		2,084	98,344	
Kurram Valley	149	3,870		194	8,075		132	5,728	
Chinese Turkistan	116	5,948		371	25,163		341	27,810	
Central Asia	2,199	1,18,234		1,468	50,798		2,818	1,16,439	









## APPENDIX No. 6.

VALUE OF IMPORTS OF MANUFACTURED WOOLLEN GOODS INTO INDIA  
BY LAND.

Articles and countries from which imported	VALUE		
	1915-16	1916-17	1917-18
	Rs	Rs	Rs
<i>Manufactured piece goods</i>			
Persia . . .	11,640	40,298	19,932
Afghanistan—			
Northern and Eastern	42,700	43,150	66,760
Southern and Western	84,989	1,02,328	95,667
Waziristan	918		
Badakhshan	2,547	3,166	2,380
Kashgar Yarkand	3,501	1,140	2,736
Chinese Turkistan	1,457	961	200
Central Asia	1,664	115	150
Tibet . . . . .	43,305	42,820	42,129
Nepal . . . . .	5,840	8,581	16,833
Sikkim	8,464	10,043	8,487
Bhutan . . . . .	6,52,532	3,13,650	4,23,063
Towang . . . . .	659	2,745	7,427
Northern Shan States . . .	1,474		
TOTAL	8,61,690	5,68,997	6,85,764
<i>Shawls</i>			
Afghanistan—Northern and Eastern	76,800	48,400	1,67,000
Dirah	17,800		
Dir, Swat and Bajaur		36,000	
Central Asia . . . . .	480		60
Tibet . . . . .	9,698	6,220	18,739
Nepal . . . . .	98		
TOTAL	1,04,876	90,620	1,85,799
GRAND TOTAL	9,66,566	6,59,617	8,71,563



## APPENDIX No 8

## PARTICULARS OF IMPORTS OF MANUFACTURED WOOLLEN AND WORSTED GOODS INTO INDIA BY SEA.

Articles and countries from which imported	Quantity						Value 1					
	1912-13	1913-14	1914-15	1915-16	1916-17	1917-18	1912-13	1913-14	1914-15	1915-16	1916-17	1917-18
<i>Yarn and knitting wool</i>	lbs	lbs	lbs	lbs	lbs	lbs	£	£	£	£	£	£
United Kingdom	100,042	148,041	82,772	04,000	125,110	80,230	10,096	16,690	9,060	12,127	29,505	20,257
Other British Possessions	202	0	2	55	25	131	23	1	1	1	3	531
TOTAL BRITISH Empire	100,034	148,047	82,774	04,145	125,144	80,360	10,119	16,691	9,061	12,131	29,508	20,310
Germany	557,221	088,352	233,743	10,400	1,105	1,453	86,806	114,077	39,059	2,982	168	4214
Belgium	8,020	0,000					938	961				
France	91,770	40,045	10,800	108			13,197	7,432	1,195	27		
Switzerland	21,456	17,100					3,347	2,757				
Italy	6,778	350					453	55				
Austria-Hungary	65,911	148,070	63,070			405	9,025	22,245	8,833			122
Japan												
Other Foreign Countries	200	10	430	1	25	13	27		115	23,136	70,013	25,828
TOTAL FOREIGN COUNTRIES	751,410	000,008	300,000	124,713	210,061	120,122	114,392	147,527	49,240	26,146	70,206	26,375
GRAND TOTAL YARN AND KNITTING WOOL	948,350	1,058,855	392,440	188,858	336,105	215,491	133,511	164,218	58,307	38,577	99,714	46,685

## APPENDIX No 8—contd

## PARTICULARS OF IMPORTS OF MANUFACTURED WOOLLEN AND WORSTED GOODS INTO INDIA BY SEA—contd

Articles and countries from which Imported	Quantity						Value					
	1912-13	1913-14	1914-15	1915-16	1916-17	1917-18	1912-13	1913-14	1914-15	1915-16	1916-17	1917-18
	lbs	lbs	lbs	lbs	lbs	lbs	£	£	£	£	£	£
<i>Brands</i>												
United Kingdom	27,445	24,072	31,605	34,035	11,958	2,849	3,720	3,377	4,507	4,504	2,896	521
Ceylon		95		0				11				
TOTAL BRITISH EMPIRE	27,445	24,167	31,605	34,041	11,958	2,849	3,720	3,388	4,507	4,504	2,896	521
Norway						386						116
Germany	1,997	3,510	612	520			346	412	108	92		
Belgium	6,610	10,371	614				1,017	1,120	99		144	
France		330	3		108			50	1			
Italy	271	300		0	3,270	1,100	43	28		6	790	133
Austria-Hungary	63,410	26,344	11,917		769		7,873	3,525	1,539		145	
Japan						45						35
TOTAL FOREIGN COUN- TRIES	72,300	40,873	13,140	520	4,140	1,731	9,279	5,135	1,747	97	1,079	284
GRAND TOTAL BRAID	99,745	65,040	44,811	34,570	16,104	4,580	13,999	8,523	6,254	4,601	3,975	805





APPENDIX No 8—*contd*PARTICULARS OF IMPORTS OF MANUFACTURED WOOLLEN AND WORSTED GOODS INTO INDIA BY SEA—*contd.*

Articles and countries from which imported	Quantity						Value					
	1912 13	1913 14	1914 15	1915 16	1916 17	1917 18	1912 13	1913 14	1914 15	1915 16	1916 17	1917 18
	lbs	lbs	lbs	lbs	lbs	lbs	£	£	£	£	£	£
United States of America—Atlantic Coast	552	571	1,187	655	305	1,160	19	46	268	62	80	134
Pacific Coast			46		113	112			1		22	4
Other Foreign Countries	661	2,711	481	246	712	1,308	125	233	56	32	78	172
TOTAL FOREIGN COUNTRIES	1,213	3,282	1,668	901	1,017	2,580	144	279	324	94	180	310
GRAND TOTAL CARRIAGES AND RATES	1,470,402	1,980,387	1,454,073	585,780	503,123	372,582	111,216	140,743	102,909	49,164	74,699	48,953
<i>HOOGHLY</i>												
United Kingdom	110,005	154,577	368,710	136,781	258,400	215,051	70,328	80,978	63,111	35,468	75,511	77,813
Hongkong	1,288	3,155	84	1,651	1,268	1,558	330	338	10	167	301	137
Australian mainland					1	1,188						100
Other British Possessions	719	781	546	619	401	126	94	36	61	84	75	20
TOTAL BRITISH POSSESSIONS	114,670	158,113	369,273	138,057	260,073	217,923	70,753	81,312	63,515	35,719	75,917	78,370
Germany	38,785	50,664	9,692	654	24	500	6,544	9,381	2,041	140	23	151
Belgium		1,064		217				133		101		

Switzerland	502	2,018	1,308	1,420	2,822	487	96	516	261	921	819	234
Italy	200	3,048	4,711	3,514	128		77	515	970	865	24	
Austria-Hungary	10,228	18,201	2,542				2,650	3,547	367			
China (exclusive of Hongkong and Macao)		80	203		2	240		10	18			139
Japan	1,078	3,038	3,054	17,557	30,272	24,235	192	776	478	5,328	5,908	6,936
United States of America—Atlantic Coast	561	341	96	328	7,003	3,849	170	94	31	162	3,361	1,089
Pacific Coast					6	20	2				3	7
Other Foreign Countries	535	113	115	5	521		86	23	38		89	
TOTAL FOREIGN COUNTRIES	57,805	70,107	21,181	23,095	41,378	29,340	9,817	14,995	4,204	7,543	9,527	9,159
GRAND TOTAL HOSIERY	471,985	537,280	330,554	162,752	301,451	247,283	80,569	96,307	67,719	43,262	85,474	87,529
<i>Piece goods</i>												
United Kingdom	13,420,354	18,012,213	0,208,303	3,765,505	7,015,053	8,472,808	895,557	1,165,540	658,323	359,305	808,978	1,118,837
Bahrein Islands	55	42	845	857			3	2	161	224		
Ceylon	1,700	924	638	1,363	4,710	5,116	162	73	74	179	341	847
Straks Settlements (including Labuan)	1,057	1,062	1,523	701	2,504	235	132	145	71	74	511	23
Hongkong	6,755	8,186	2,099	1,812	2,311	912	328	397	84	135	112	49
Natal	200	1,463	810	347	620	216	23	116	55	44	41	34
Mauritius and Dependencies			36	100		528			2	7		136
Australian Commonwealth (Total)	1,700				1,123	16,805	117				165	1,484
Other British Possessions	140	08	277	50	6	60	21	8	23	7	1	5
TOTAL BRITISH EMPIRE	13,438,810	18,624,888	0,214,000	3,770,809	7,927,326	8,496,747	896,333	1,166,281	658,093	359,975	870,149	1,121,415

APPENDIX No 8—*contd*PARTICULARS OF IMPORTS OF MANUFACTURED WOOLLEN AND WORSTED GOODS INTO INDIA BY SEA—*contd.*

Articles and countries from which imported	Quantity						Value					
	1912-13	1913-14	1914-15	1915-16	1916-17	1917-18	1912-13	1913-14	1914-15	1915-16	1916-17	1917-18
<i>Piece goods—contd</i>	Yds	Yds	Yds	Yds	Yds	Yds	£	£	£	£	£	£
Germany	4,883,354	4,871,312	1,418,144	209,518	4,004	2,530	261,477	265,843	84,039	15,984	225	511
Holland	167,708	204,580	204,258	60,617	50,033	4,641	19,700	33,955	25,215	8,186	7,559	883
Belgium	125,314	278,317	70,530	18,309			12,581	25,483	8,274	1,977		
France	1,277,230	2,231,744	1,429,057	281,445	11,719	8,051	74,513	146,091	84,535	24,775	1,415	1,027
Switzerland	65,800	50,320	20,181	101,671	90,370	59,089	2,481	2,111	770	4,079	6,002	3,226
Italy	80,231	259,013	38,080	64,169	11,438		4,516	11,827	2,131	3,101	734	
Austria-Hungary	507,640	700,771	101,890		7,432	15,713	23,252	32,547	7,743		238	4,129
China (exclusive of Hongkong and Macao)	412	252	2,558	101		570	28	36	238	24		47
Japan	478	1,859	1,031	92,480	744,107	624,590	27	78	48	4,131	50,665	53,098
Portuguese East Africa			11		1,209						106	
United States of America—Atlantic Coast	548	145	230	17	17,311	24,327	28	6	5	16	2,304	1,429
Other Foreign Countries	1,612	965	700	70	784	1,271	153	101	42	6	100	134
TOTAL FOREIGN COUNTRIES	7,119,399	8,701,884	3,155,697	901,491	919,407	732,088	398,786	548,078	213,030	62,279	69,248	64,484
GRAND TOTAL PIECE GOODS	20,558,218	27,328,772	12,570,297	4,072,300	3,806,793	9,228,735	1,595,119	1,681,559	872,023	492,254	939,397	1,185,899

[illegible]

APPENDIX No. 8—*concl'd.*PARTICULARS OF IMPORTS OF MANUFACTURED WOOLLEN AND WORSTED GOODS INTO INDIA BY SEA—*concl'd.*

Articles and commodities from which imported	Quantity.						Value					
	1912 '1	1913 '1	1914-15	1915 '16	1916-17	1917 '18	1912 '13	1913-14	1914-15	1915 '16	1916 '17	1917-18
Other sorts— <i>concl'd</i>												
Hongkong	10,105	10,177	8	7,302	1,518	104	505	1,025	3	605	187	12
Other British Possessions	1,121	2,258	888	1,185	100	310	79	77	29	63	17	15
TOTAL BRITISH EMPIRE	1,058,120	1,010,555	610,017	100,010	550,115	221,714	65,626	61,911	22,219	31,031	53,216	21,103
Germany	131,051	183,112	25,020	717	170		5,608	10,756	1,912	72	32	
Holland	2,110	0,814	5				65	288				
Belgium	2,877	11,100	17,102				217	313	152			
France	101,700	175,051	01,620	221	21,913	015	5,156	5,473	2,020	12	1,003	115
Switzerland		10	7,597					2	100			
Italy	1,038	80,101	110,518	110	2,040		197	6,191	908	69	618	
Austria Hungary	5,001	8,085	621			785	518	526	109			05
Japan	10	13	28	008	581,011	1,522	5	1	1	9	38,711	110
Other Foreign Countries	870	2,101	1,811	102	1,151	14	71	135	105	49	83	4
TOTAL FOREIGN COUNTRIES	310,107	170,031	121,175	2,350	611,010	9,200	14,897	23,991	5,728	211	41,070	711
GRAND TOTAL, OTHER SORTS	1,368,323	1,550,180	940,192	401,378	1,168,004	221,004	80,503	84,905	37,947	31,975	94,316	21,727
GRAND TOTAL OF ALL WOOLLEN MANUFACTURES							2,174,020	2,701,050	1,366,074	794,051	1,480,544	1,493,341

# APPENDIX No. 9.

Appendix.

INDIA BY SEA.

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## PARTICULARS OF EXPORTS OF MANUFACTURED WOOLLEN AND WORSTED GOODS

Articles and countries of destination	1912 13	1913 14	1914 15	1915 16	1916 17	1917 18	1912 13	1913 14	1914 15	1915 16	1916 17	1917 18
<i>Carpet and rug.</i>	lbs	lbs	lbs	lbs	lbs	lbs	£	£	£	£	£	£
United Kingdom	1,462,783	1,351,512	793,080	1,101,753	977,691	100,988	118,612	119,011	68,626	88,010	82,107	18,936
Gibraltar		190	1,852	1,389	30,196	89,291	1,713	10	220	67	1,185	4,096
Ceylon	18,181	14,172	3,051	1,537	5,005	8,538	230	1,070	107	169	571	651
Strait Settlements (including Labuan)	1,101	1,810	1,530	1,537	2,970	2,596	55	103	203	105	611	723
Hongkong		2,152	1,271	2,170	11,078	0,253	555	768	666	1,592	1,112	1,167
Egypt (a)	6,521	10,337	8,491	1,008	25,091	72,272	2,388	7,017	900	1,592	2,254	6,770
Cape Colony	27,011	41,081	13,513	112,001	118,115	158,221	6	17	9	9,137	9,092	10,259
Natal					920	1,112					933	1,059
Transvaal	45	600	120	1,280							93	170
East African Protectorate					1,093							
Canada—Atlantic Coast	5,001	896	781	1,093			1,081	158	101	80	160	
Pacific Coast	2,143	1,111	972	500					101	101	206	87
Western Australia	3,325	402		8,391	1,011						198	18
South Australia (including Northern Territory)	1,989		2,409	3,152	18,771		278	11	250	053		
Victoria	10,333	8,070	8,710	1,002	18,771		1,107	985	792	107	2,000	019
Tasmania	140	205	60	3								
New South Wales	19,439	30,198	28,521	91,207	100,112		2,150	3,706	2,305	1,512	8,148	10,077

(a) Included in "Foreign Countries" prior to 1915-16

APPENDIX No. 9—*contd*PARTICULARS OF EXPORTS OF MANUFACTURED WOOLLEN AND WORSTED GOODS FROM INDIA BY SEA—*contd*

Articles and countries of final destination	1912 13	1913 14	1914-15	1915-16	1916-17	1917-18	1912 13	1913 14	1914-15	1915-16	1916-17	1917-18
	lbs	lbs	lbs	lbs	lbs	lbs	£	£	£	£	£	£
<i>Carpets and rugs—contd</i>												
Queensland	230	1,385		1,008	3,485	1,604	45	74			321	229
Australian Commonwealth (Total)	30,462	47,636	39,790	76,295	119,106	109,644	3,922	4,855	3,433	5,677	11,089	11,089
New Zealand	9,353	15,321	24,022	39,891	77,654	47,841	690	1,468	2,030	3,034	7,843	4,657
Other British Possessions	832	37	480	502	108	224	43	5	67	38	17	22
<b>TOTAL BRITISH EXPORTS</b>	<b>1,558,129</b>	<b>1,492,938</b>	<b>918,895</b>	<b>1,398,141</b>	<b>1,422,130</b>	<b>1,029,000</b>	<b>130,382</b>	<b>136,389</b>	<b>79,769</b>	<b>109,475</b>	<b>117,570</b>	<b>50,196</b>
Sweden	178	334			18,596		100	70			1,212	
Norway	474	907	672	697	13,611	4,007	112	138	172	61	1,200	315
Denmark	5,002	50			91,688	16,219	295	6			6,853	2,808
Germany	11,825	15,557	3,924				2,023	2,555	807			
Holland	204	1,830	50				33	188	5			
Belgium	529	3,100	445				93	217	190			
France	18,785	6,521	459	84	448		1,552	567	91	33	17	
Switzerland		230	1,594	42	800			26		10	1,199	
Italy	538	535	1,336	336			96	127	93	53		
Austria Hungary	1,906	5,553	1,892				276	799	348			
Persia	820	224					170	10				
Java	529	7,456	3,482	988	9,205	4,088	40	1,193	470	173	1,127	546

	10	175	224	70	4,072	1,598	3	23	43	15	440	128
China (exclusive of Hongkong and Shaoai)	3,170	3,021	4,048				246	281	346			
Egypt (b)		352		1,431	1,230	2,000		79		61	150	253
Portuguese East Africa	810	84	200				117	3	47			
German East Africa												
United States of America—Atlantic Coast	05,570	90,328	105,183	178,748	284,287	123,070	14,055	13,510	19,442	35,124	49,781	36,739
Pacific Coast	103	411		801	10,784	7,408	33	59		242	2,736	2,150
Other Foreign Countries	2,322	1,232	1,008	568	024	200	130	206	109	73	158	484
TOTAL PORTFOLIO COUNTRIES	112,832	117,812	124,877	183,728	436,335	100,270	19,374	20,067	22,285	35,845	61,883	43,483
GRAND TOTAL CAR TRAFFIC AND TONS	1,700,061	1,640,770	1,043,772	1,581,869	1,858,474	789,339	140,756	156,446	102,054	145,320	182,453	93,670
<i>Piece goods</i>	Yds	Yds	Yds	Yds	Yds	Yds	£	£	£	£	£	£
United Kingdom		307	1,394	800				77	59	155		
Ceylon	000	295	77	848		822	70	44	13	109		77
Strait Settlements (including Indian)	500	1,173		400	105		100	73	25		21	
East Africa Protectorate				2,037	108					557	0	
Australian Commonwealth					5,534					000		
Other British Possessions			1,033	001	810	46			46	152	111	12
TOTAL BRITISH DOMINIUM	1,100	2,275	2,504	5,390	6,657	808	170	191	118	998	1,071	89
Persian Gulf—Turkey, Aden	19,550	1,580					1,491	126				
Persia		5,601						231				
JAVA	80			56	2,100		16			10	111	

(b) Included in "British Possessions" from 1915 to 1916







## APPENDIX No. 9—concl'd.

## PARTICULARS OF EXPORTS OF MANUFACTURED WOOLLEN AND WORSTED GOODS INTO INDIA BY SEA—concl'd.

Articles and countries of final destination.	1912-13	1913-14	1914-15	1915-16	1916-17	1917-18	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24	1924-25	1925-26	1926-27	1927-28	1928-29	1929-30	1930-31	1931-32	1932-33	1933-34	1934-35	1935-36	1936-37	1937-38	1938-39	1939-40	1940-41	1941-42	1942-43	1943-44	1944-45	1945-46	1946-47	1947-48	1948-49	1949-50	1950-51	1951-52	1952-53	1953-54	1954-55	1955-56	1956-57	1957-58	1958-59	1959-60	1960-61	1961-62	1962-63	1963-64	1964-65	1965-66	1966-67	1967-68	1968-69	1969-70	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31	2031-32	2032-33	2033-34	2034-35	2035-36	2036-37	2037-38	2038-39	2039-40	2040-41	2041-42	2042-43	2043-44	2044-45	2045-46	2046-47	2047-48	2048-49	2049-50	2050-51	2051-52	2052-53	2053-54	2054-55	2055-56	2056-57	2057-58	2058-59	2059-60	2060-61	2061-62	2062-63	2063-64	2064-65	2065-66	2066-67	2067-68	2068-69	2069-70	2070-71	2071-72	2072-73	2073-74	2074-75	2075-76	2076-77	2077-78	2078-79	2079-80	2080-81	2081-82	2082-83	2083-84	2084-85	2085-86	2086-87	2087-88	2088-89	2089-90	2090-91	2091-92	2092-93	2093-94	2094-95	2095-96	2096-97	2097-98	2098-99	2099-00	2100-01	2101-02	2102-03	2103-04	2104-05	2105-06	2106-07	2107-08	2108-09	2109-10	2110-11	2111-12	2112-13	2113-14	2114-15	2115-16	2116-17	2117-18	2118-19	2119-20	2120-21	2121-22	2122-23	2123-24	2124-25	2125-26	2126-27	2127-28	2128-29	2129-30	2130-31	2131-32	2132-33	2133-34	2134-35	2135-36	2136-37	2137-38	2138-39	2139-40	2140-41	2141-42	2142-43	2143-44	2144-45	2145-46	2146-47	2147-48	2148-49	2149-50	2150-51	2151-52	2152-53	2153-54	2154-55	2155-56	2156-57	2157-58	2158-59	2159-60	2160-61	2161-62	2162-63	2163-64	2164-65	2165-66	2166-67	2167-68	2168-69	2169-70	2170-71	2171-72	2172-73	2173-74	2174-75	2175-76	2176-77	2177-78	2178-79	2179-80	2180-81	2181-82	2182-83	2183-84	2184-85	2185-86	2186-87	2187-88	2188-89	2189-90	2190-91	2191-92	2192-93	2193-94	2194-95	2195-96	2196-97	2197-98	2198-99	2199-00	2200-01	2201-02	2202-03	2203-04	2204-05	2205-06	2206-07	2207-08	2208-09	2209-10	2210-11	2211-12	2212-13	2213-14	2214-15	2215-16	2216-17	2217-18	2218-19	2219-20	2220-21	2221-22	2222-23	2223-24	2224-25	2225-26	2226-27	2227-28	2228-29	2229-30	2230-31	2231-32	2232-33	2233-34	2234-35	2235-36	2236-37	2237-38	2238-39	2239-40	2240-41	2241-42	2242-43	2243-44	2244-45	2245-46	2246-47	2247-48	2248-49	2249-50	2250-51	2251-52	2252-53	2253-54	2254-55	2255-56	2256-57	2257-58	2258-59	2259-60	2260-61	2261-62	2262-63	2263-64	2264-65	2265-66	2266-67	2267-68	2268-69	2269-70	2270-71	2271-72	2272-73	2273-74	2274-75	2275-76	2276-77	2277-78	2278-79	2279-80	2280-81	2281-82	2282-83	2283-84	2284-85	2285-86	2286-87	2287-88	2288-89	2289-90	2290-91	2291-92	2292-93	2293-94	2294-95	2295-96	2296-97	2297-98	2298-99	2299-00	2300-01	2301-02	2302-03	2303-04	2304-05	2305-06	2306-07	2307-08	2308-09	2309-10	2310-11	2311-12	2312-13	2313-14	2314-15	2315-16	2316-17	2317-18	2318-19	2319-20	2320-21	2321-22	2322-23	2323-24	2324-25	2325-26	2326-27	2327-28	2328-29	2329-30	2330-31	2331-32	2332-33	2333-34	2334-35	2335-36	2336-37	2337-38	2338-39	2339-40	2340-41	2341-42	2342-43	2343-44	2344-45	2345-46	2346-47	2347-48	2348-49	2349-50	2350-51	2351-52	2352-53	2353-54	2354-55	2355-56	2356-57	2357-58	2358-59	2359-60	2360-61	2361-62	2362-63	2363-64	2364-65	2365-66	2366-67	2367-68	2368-69	2369-70	2370-71	2371-72	2372-73	2373-74	2374-75	2375-76	2376-77	2377-78	2378-79	2379-80	2380-81	2381-82	2382-83	2383-84	2384-85	2385-86	2386-87	2387-88	2388-89	2389-90	2390-91	2391-92	2392-93	2393-94	2394-95	2395-96	2396-97	2397-98	2398-99	2399-00	2400-01	2401-02	2402-03	2403-04	2404-05	2405-06	2406-07	2407-08	2408-09	2409-10	2410-11	2411-12	2412-13	2413-14	2414-15	2415-16	2416-17	2417-18	2418-19	2419-20	2420-21	2421-22	2422-23	2423-24	2424-25	2425-26	2426-27	2427-28	2428-29	2429-30	2430-31	2431-32	2432-33	2433-34	2434-35	2435-36	2436-37	2437-38	2438-39	2439-40	2440-41	2441-42	2442-43	2443-44	2444-45	2445-46	2446-47	2447-48	2448-49	2449-50	2450-51	2451-52	2452-53	2453-54	2454-55	2455-56	2456-57	2457-58	2458-59	2459-60	2460-61	2461-62	2462-63	2463-64	2464-65	2465-66	2466-67	2467-68	2468-69	2469-70	2470-71	2471-72	2472-73	2473-74	2474-75	2475-76	2476-77	2477-78	2478-79	2479-80	2480-81	2481-82	2482-83	2483-84	2484-85	2485-86	2486-87	2487-88	2488-89	2489-90	2490-91	2491-92	2492-93	2493-94	2494-95	2495-96	2496-97	2497-98	2498-99	2499-00	2500-01	2501-02	2502-03	2503-04	2504-05	2505-06	2506-07	2507-08	2508-09	2509-10	2510-11	2511-12	2512-13	2513-14	2514-15	2515-16	2516-17	2517-18	2518-19	2519-20	2520-21	2521-22	2522-23	2523-24	2524-25	2525-26	2526-27	2527-28	2528-29	2529-30	2530-31	2531-32	2532-33	2533-34	2534-35	2535-36	2536-37	2537-38	2538-39	2539-40	2540-41	2541-42	2542-43	2543-44	2544-45	2545-46	2546-47	2547-48	2548-49	2549-50	2550-51	2551-52	2552-53	2553-54	2554-55	2555-56	2556-57	2557-58	2558-59	2559-60	2560-61	2561-62	2562-63	2563-64	2564-65	2565-66	2566-67	2567-68	2568-69	2569-70	2570-71	2571-72	2572-73	2573-74	2574-75	2575-76	2576-77	2577-78	2578-79	2579-80	2580-81	2581-82	2582-83	2583-84	2584-85	2585-86	2586-87	2587-88	2588-89	2589-90	2590-91	2591-92	2592-93	2593-94	2594-95	2595-96	2596-97	2597-98	2598-99	2599-00	2600-01	2601-02	2602-03	2603-04	2604-05	2605-06	2606-07	2607-08	2608-09	2609-10	2610-11	2611-12	2612-13	2613-14	2614-15	2615-16	2616-17	2617-18	2618-19	2619-20	2620-21	2621-22	2622-23	2623-24	2624-25	2625-26	2626-27	2627-28	2628-29	2629-30	2630-31	2631-32	2632-33	2633-34	2634-35	2635-36	2636-37	2637-38	2638-39	2639-40	2640-41	2641-42	2642-43	2643-44	2644-45	2645-46	2646-47	2647-48	2648-49	2649-50	2650-51	2651-52	2652-53	2653-54	2654-55	2655-56	2656-57	2657-58	2658-59	2659-60	2660-61	2661-62	2662-63	2663-64	2664-65	2665-66	2666-67	2667-68	2668-69	2669-70	2670-71	2671-72	2672-73	2673-74	2674-75	2675-76	2676-77	2677-78	2678-79	2679-80	2680-81	2681-82	2682-83	2683-84	2684-85	2685-86	2686-87	2687-88	2688-89	2689-90	2690-91	2691-92	2692-93	2693-94	2694-95	2695-96	2696-97	2697-98	2698-99	2699-00	2700-01	2701-02	2702-03	2703-04	2704-05	2705-06	2706-07	2707-08	2708-09	2709-10	2710-11	2711-12	2712-13	2713-14	2714-15	2715-16	2716-17	2717-18	2718-19	2719-20	2720-21	2721-22	2722-23	2723-24	2724-25	2725-26	2726-27	2727-28	2728-29	2729-30	2730-31	2731-32	2732-33	2733-34	2734-35	2735-36	2736-37	2737-38	2738-39	2739-40	2740-41	2741-42	2742-43	2743-44	2744-45	2745-46	2746-47	2747-48	2748-49	2749-50	2750-51	2751-52	2752-53	2753-54	2754-55	2755-56	2756-57	2757-58	2758-59	2759-60	2760-61	2761-62	2762-63	2763-64	2764-65	2765-66	2766-67	2767-68	2768-69	2769-70	2770-71	2771-72	2772-73	2773-74	2774-75	2775-76	2776-77	2777-78	2778-79	2779-80	2780-81	2781-82	2782-83	2783-84	2784-85	2785-86	2786-87	2787-88	2788-89	2789-90	2790-91	2791-92	2792-93	2793-94	2794-95	2795-96	2796-97	2797-98	2798-99	2799-00	2800-01	2801-02	2802-03	2803-04	2804-05	2805-06	2806-07	2807-08	2808-09	2809-10	2810-11	2811-12	2812-13	2813-14	2814-15	2815-16	2816-17	2817-18	2818-19	2819-20	2820-21	2821-22	2822-23	2823-24	2824-25	2825-26	2826-27	2827-28	2828-29	2829-30	2830-31	2831-32	2832-33	2833-34	2834-35	2835-36	2836-37	2837-38	2838-39	2839-40	2840-41	2841-42	2842-43	2843-44	2844-45	2845-46	2846-47	2847-48	2848-49	2849-50	2850-51	2851-52	2852-53	2853-54	2854-55	2855-56	2856-57	2857-58	2858-59	2859-60	2860-61	2861-62	2862-63	2863-64	2864-65	2865-66	2866-67	2867-68	2868-69	2869-70	2870-71	2871-72	2872-73	2873-74	2874-75	2875-76	2876-77	2877-78	2878-79	2879-80	2880-81	2881-82	2882-83	2883-84	2884-85	2885-86	2886-87	2887-88	2888-89	2889-90	2890-91	2891-92	2892-93	2893-94	2894-95	2895-96	2896-97	2897-98	2898-99	2899-00	2900-01	2901-02	2902-03	2903-04	2904-05	2905-06	2906-07	2907-08	2908-09	2909-10	2910-11	2911-12	2912-13	2913-14	2914-15	2915-16	2916-17	2917-18	2918-19	2919-20	2920-21	2921-22	2922-23	2923-24	2924-25	2925-26	2926-27
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## APPENDIX No 10

PARTICULARS OF THE NUMBER OF SHEEP IN EACH PROVINCE OF  
BRITISH INDIA

Province	Year	Number of Sheep
Bengal (a)	{ 1908 09 . .	1,315,240
	{ 1909 10 . .	1,336,872
	{ 1910 11 . .	1,394,713
Madras .	{ 1901 05 . .	7,904,582
	{ 1909 10 . .	10,752,471
	{ 1914-15 . .	10,765,543
Bombay . . .	{ 1905 06 . .	1,824,379
	{ 1909-10 . .	1,846,596
	{ 1915-16 . .	1,699,196
Sind . . . .	{ 1905 06 . .	302,063
	{ 1909-10 . .	424,283
	{ 1915 16 . .	514,463
Agra . . . .	{ 1903 01 . .	2,054,612
	{ 1908 09 . .	2,146,803
	{ 1914-15 . .	2,077,209
Oudh . . . .	{ 1903 04 . .	683,436
	{ 1908 09 . .	709,049
	{ 1914-15 . .	717,396
Bihar and Orissa	{ 1911-12 . .	952,364
	{ 1912 13 . .	1,099,156
	{ 1913 14 . .	1,168,709
Punjab	{ 1903 04 . .	4,084,651
	{ 1908 09 . .	4,591,591
	{ 1912 13 . .	4,582,100
	{ 1913 14 . .	4,676,899
Upper Burma . .	{ 1906 07 . .	21,552
	{ 1907 08 . .	27,716
	{ 1908 09 . .	26,902
	{ 1909-10 . .	32,802
	{ 1910-11 . .	33,295
	{ 1911-12 . .	30,961
	{ 1912-13 . .	30,495
	{ 1913-14 . .	30,110
	{ 1914-15 . .	31,933
	{ 1915-16 . .	35,536

(a) These figures for Bengal which are based on estimates include Bihar and Orissa but exclude Eastern Bengal

APPENDIX No 10—*contd*PARTICULARS OF THE NUMBER OF SHEEP IN EACH PROVINCE OF  
BRITISH INDIA

Province	Year	Number of Sheep
Lower Burma	1906 07	1,901
	1907-08	1,951
	1908-09	2,316
	1909-10	1,964
	1910 11	1,759
	1911-12	2,061
	1912-13	2,022
	1913-14	2,221
	1914 15	2,396
Central Provinces	1915 16	1,449
	1906-07	289,505
	1907 08	317,957
	1908 09	315,487
	1909-10	350,833
	1910 11	335,435
	1911-12	339,017
	1912-13	325,595
	1913-14	335,069
Berar	1914-15	200,242
	1915-16	286,768
	1906 07	203,982
	1907 08	172,551
	1908-09	172,159
	1909-10	175,557
	1910 11	178,310
	1911-12	186,197
	1912 13	149,060
Assam	1913-14	153,150
	1914-15	150,013
	1915-16	145,482
	1904 05	17,326
	1906 07	17,961
	1909-10 <sup>(a)</sup>	17,637
North-West Frontier Province	1911-12	17,902
	1912 13	17,869
	1914 15	11,650
	1903 04	133,771
	1908 09	620,960
	1913 14	601,001

(a) The census is not taken simultaneously in the different districts of Assam and in some years the figures do not include all districts. This would seem to explain the drop in figures after 1906 07.

APPENDIX No 10—*concl'd*PARTICULARS OF THE NUMBER OF SHEEP IN EACH PROVINCE OF  
BRITISH INDIA

Province	Year	Number of Sheep
Ajmere-Merwara . . .	1903-04 .	207,092
	1908-09	237,474
	1913-14	225,179
	1914-15	239,596
	1915-16	256,485
Delhi	1913-14	9,504
	1914-15 (c)	9,504
Coorg (a)	1904-05	310
	1909-10	284
	1914-15	110
Pargana Manpur (Central India) (b)	1906-07	
	1907-08	
	1908-09	
	1909-10	
	1910-11	2
	1911-12	30
	1912-13	15
	1913-14	12
	1914-15	10
TOTAL IN BRITISH INDIA	1906-07 (d)	18,029,800
	1907-08 (d)	18,033,035
	1908-09 (c)	20,187,579
	1909-10 (c)	23,235,176
	1910-11 (c)	23,280,662
	1911-12 (c)	24,242,756
	1912-13 (d)	22,934,265
	1913-14 (d)	23,091,955
	1914-15 (d)	23,015,836
	1915-16 (d)	22,970,403

(a) In Coorg the table is prepared quinquennially on a census taken every five years. The last census was taken in March 1915 by the circle *shanbogs*, and the particulars entered in a register maintained under Rule 73 of the Rules framed under the Coorg Land and Revenue Regulation 1899. Animals in municipal towns are included.

(b) An annual census is taken on the 15th March in Manpur.

(c) Statistics based on a census taken in 1913-14.

(d) Excluding Bengal.

(e) Excluding Eastern Bengal.

## APPENDIX No. 13.

## STATISTICS OF AUSTRALASIAN WOOL SALES AND VALUES.

Season	Bales	Net weight	Gross value	Average per bale		
		- lbs	£	£	s	d.
1916-17	2,216,581	722,505,576	45,631,102	20	11	8
1915-16	1,807,979	580,234,830	29,903,532	16	10	10
1914-15	1,544,799	504,533,053	19,742,546	12	15	7
1913-14	1,968,578	639,769,519	26,079,536	13	4	11
1912-13	1,804,801	579,750,442	24,642,643	13	13	1
1911-12	1,926,926	638,197,891	22,682,090	11	15	5
1910-11	1,865,167	612,365,881	23,346,602	12	10	4
1909-10	1,889,745	634,009,448	25,712,774	13	12	2
1908-09	1,657,906	543,653,485	18,605,529	11	6	10
1907-08	1,351,121	450,869,077	17,777,249	13	0	2
1906-07	1,537,798	522,389,990	21,835,131	14	3	11
1905-06	1,354,865		18,304,012	13	10	3
1904-05	1,092,651		13,825,269	12	13	1
1903-04	837,497		10,046,656	12	0	0
TOTAL	22,856,414		318,134,671	13	18	4

## APPENDIX No. 14.

COMPARISON OF RECORD PRICES RECEIVED IN AUSTRALIA FOR VARIOUS  
DESCRIPTORS OF GREASY AND SCoured WOOL

(Pence per lb)

	1916 17	1915-16	1914-15	1913-14	1912-13
<i>Greasy</i>	<i>d</i>	<i>d</i>	<i>d</i>	<i>d</i>	<i>d</i>
Fleece	33½	24½	18½	20½	19½
Broken	28½	20½	14½	16½	16
Pieces	26½	20½	14½	14½	15
Bellies	24½	17½	12½	13	13½
Stained pieces	14½	12	8½	9½	9½
Locks	11	9½	7½	8½	8½
Lambs	25½	29½	17½	20½	23½
Comeback—					
Fleece	30½	24	17	16½	16½
Lambs	24	20	14½	16½	20
Cross bred—					
Fleece	29	23½	18	15	15½
Lambs	22½	19	17½	16½	15½
<i>Scoured</i>					
Merino—					
Fleece	46½	44½	28	28	26½
Lambs	41½	40½	25	23½	22½
Pieces	40	30		24½	23½
Cross bred—					
Fleece	39	36½	22½	20½	20½